

BUSH HOG®

Front End Loaders

3545 / 4045 / 5045 / 6045

Operator's Manual



BUSH HOG®
Performance You Can Count On™

ASSEMBLY ● OPERATION ● MAINTENANCE

CONGRATULATIONS!

You have invested in the best implement of its type on the market today.

The care you give your Bush Hog implement will greatly determine your satisfaction with its performance and its service life. We urge a careful study of this manual to provide you with a thorough understanding of your new implement before operating, as well as suggestions for operation and maintenance.

If your manual should become lost or destroyed, Bush Hog will be glad to provide you with a new copy. Order from Bush Hog, P. O. Box 1039, Selma, Alabama 36702-1039. Most of our manuals can also be downloaded from our website at www.bushhog.com.

As an authorized Bush Hog dealer, we stock genuine Bush Hog parts which are manufactured with the same precision and skill as our original equipment. Our trained service personnel are well informed on methods required to service Bush Hog equipment, and are ready and able to help you.

Should you require additional information or assistance, please contact us.

YOUR AUTHORIZED
BUSH HOG DEALER

BECAUSE BUSH HOG MAINTAINS AN ONGOING PROGRAM OF PRODUCT IMPROVEMENT, WE RESERVE THE RIGHT TO MAKE IMPROVEMENTS IN DESIGN OR CHANGES IN SPECIFICATIONS WITHOUT INCURRING ANY OBLIGATION TO INSTALL THEM ON UNITS PREVIOUSLY SOLD.

BECAUSE OF THE POSSIBILITY THAT SOME PHOTOGRAPHS IN THIS MANUAL WERE TAKEN OF PROTOTYPE MODELS, PRODUCTION MODELS MAY VARY IN SOME DETAIL. IN ADDITION, SOME PHOTOGRAPHS MAY SHOW SHIELDS REMOVED FOR PURPOSES OF CLARITY. **NEVER OPERATE** THIS IMPLEMENT WITHOUT ALL SHIELDS IN PLACE.

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OPTIONAL EQUIPMENT INSTRUCTIONS AT END OF MANUAL

NOTE: Some optional equipment information may not apply to your particular loader.

RETAIL CUSTOMER'S RESPONSIBILITY UNDER THE BUSH HOG WARRANTY

It is the Retail Customer and/or Operator's responsibility to read the Operator's Manual, to operate, lubricate, maintain and store the product in accordance with all instructions and safety procedures. Failure of the operator to read the Operator's Manual is a misuse of this equipment.

It is the Retail Customer and/or Operator's responsibility to inspect the product and to have any part(s) repaired or replaced when continued operation would cause damage or excessive wear to other parts or cause a safety hazard.

It is the Retail Customer's responsibility to deliver the product to the authorized Bush Hog Dealer, from whom he purchased it, for service or replacement of defective parts which are covered by warranty. Repairs to be submitted for warranty consideration must be made within forty-five (45) days of failure.

It is the Retail Customer's responsibility for any cost incurred by the Dealer for traveling to or hauling of the product for the purpose of performing a warranty obligation or inspection.



LIMITED WARRANTY



Bush Hog warrants to the original purchaser of any new Bush Hog equipment, purchased from an authorized Bush Hog dealer, that the equipment be free from defects in material and workmanship for a period of one (1) year for non-commercial, state, and municipalities' use and ninety (90) days for commercial use from date of retail sale. The obligation of Bush Hog to the purchaser under this warranty is limited to the repair or replacement of defective parts.

Replacement or repair parts installed in the equipment covered by this limited warranty are warranted for ninety (90) days from the date of purchase of such part or to the expiration of the applicable new equipment warranty period, whichever occurs later. Warranted parts shall be provided at no cost to the user at an authorized Bush Hog dealer during regular working hours. Bush Hog reserves the right to inspect any equipment or parts which are claimed to have been defective in material or workmanship.

DISCLAIMER OF IMPLIED WARRANTIES & CONSEQUENTIAL DAMAGES

Bush Hog's obligation under this limited warranty, to the extent allowed by law, is in lieu of all warranties, implied or expressed, **INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE** and any liability for incidental and consequential damages with respect to the sale or use of the items warranted. Such incidental and consequential damages shall include but not be limited to: transportation charges other than normal freight charges; cost of installation other than cost approved by Bush Hog; duty; taxes; charges for normal service or adjustment; loss of crops or any other loss of income; rental of substitute equipment, expenses due to loss, damage, detention or delay in the delivery of equipment or parts resulting from acts beyond the control of Bush Hog.

THIS LIMITED WARRANTY SHALL NOT APPLY:

1. To vendor items which carry their own warranties, such as engines, tires, and tubes.
2. If the unit has been subjected to misapplication, abuse, misuse, negligence, fire or other accident.
3. If parts not made or supplied by Bush Hog have been used in connection with the unit, if, in the sole judgement of Bush Hog such use affects its performance, stability or reliability.
4. If the unit has been altered or repaired outside of an authorized Bush Hog dealership in a manner which, in the sole judgement of Bush Hog, affects its performance, stability or reliability.
5. To normal maintenance service and normal replacement items such as gearbox lubricant, hydraulic fluid, worn blades, or to normal deterioration of such things as belts and exterior finish due to use or exposure.
6. To expendable or wear items such as teeth, chains, sprockets, belts, springs and any other items that in the company's sole judgement is a wear item.

NO EMPLOYEE OR REPRESENTATIVE OF BUSH HOG IS AUTHORIZED TO CHANGE THIS LIMITED WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY UNLESS SUCH CHANGE IS MADE IN WRITING AND SIGNED BY BUSH HOG'S SERVICE MANAGER, POST OFFICE BOX 1039, SELMA, ALABAMA 36702-1039.



Record the model number, serial number and date purchased. This information will be helpful to your dealer if parts or service are required.

MODEL NUMBER _____

MAKE CERTAIN THE WARRANTY REGISTRATION CARD HAS BEEN FILED WITH BUSH HOG/
SELMA, ALABAMA

SERIAL NUMBER _____

DATE OF RETAIL SALE _____

DEALER PREPARATION CHECK LIST

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BEFORE DELIVERING MACHINE - The following check list should be completed.
Use the Operator's Manual as a guide.

- ☐ Machine properly assembled.
- ☐ All safety decals readable. (See decal page)
- ☐ All bolts tightened to torque specifications given in torque chart.
- ☐ Machine operates properly.
- ☐ Customer has appropriate mounting kit for his tractor and loader.
- ☐ Customer has appropriate attachments for loader operations. (Buckets for lifting loose materials; bale spear for lifting round bales; fork lift for lifting palletized material)

CAUTION

**USE ROPS (ROLLOVER PROTECTIVE STRUCTURE) AND
SEAT BELT EQUIPPED TRACTORS FOR OPERATOR USE
IN ALL LOADER OPERATIONS.**

- ☐ Operators manual has been delivered to owner and he has been instructed on the safe and proper use of the front end loader.

Dealer's Signature _____

Purchaser's Signature _____

THIS CHECK LIST TO REMAIN IN OPERATOR'S MANUAL

It is the responsibility of the dealer to complete the procedures listed
above before delivery of this implement to the customer.

Safety Alert Symbol



This Safety Alert Symbol means: “**ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**”

This symbol is used to call attention to safety precautions that should be followed by the operator to avoid accidents. When you see this symbol, carefully read the message that follows and heed its advice. Failure to comply with safety precautions could result in death or serious bodily injury.

Safety Signs *Signal Words*

The signal words **DANGER, WARNING, AND CAUTION** are used on the equipment safety signs. These words are intended to alert the viewer to the existence and the degree of hazard seriousness.



White letters on **RED**

This signal word indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.



Black letters on **ORANGE**

This signal word indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury

It may also be used to alert against unsafe practices.



Black letters on **YELLOW**

This signal word indicates a potentially hazardous situation exist which, if not avoided, may result in minor or moderate injury.

It may also be used to alert against unsafe practices.

IMPORTANT SAFETY PRECAUTIONS

This symbol is used to call attention to safety precautions that should be followed by the operator to avoid accidents. When you see this symbol, carefully read the message that follows and heed its advice. Failure to comply with safety precautions could result in death or serious bodily injury.



In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel in the operation, transport, maintenance and storage of equipment. Lack of attention to safety can result in accident, personal injury, reduction of efficiency and worst of all—loss of life. Watch for safety hazards and correct deficiencies promptly. Use the following safety precautions as a general guide to safe operations when using this machine. Additional safety precautions are used throughout this manual for specific operating and maintenance procedures. Read this manual and review the safety precautions often until you know the limitations.

THE TRACTOR

1. Read the tractor operator's manual to learn how to operate your tractor safely. Failure to do so could result in serious injury or death and equipment damage.
2. Use ROPS (Roll-Over Protective Structure) and seat belt equipped tractors for operator use in all loader operations.
3. Add wheel ballast or rear weight for stability.
4. Move wheels to the tractor manufacturer's widest recommended settings to increase stability.
5. For better stability, use tractor with wide front axle rather than tricycle front wheels.
6. Move and turn the tractor at low speeds.
7. Stop tractor engine, place transmission in park (or neutral), engage parking brake, lower loader arms to ground, cycle all hydraulic controls to relieve pressure, allow machine moving parts to stop, remove ignition key to prevent unauthorized person from starting engine before dismounting tractor or servicing, repairing, or making adjustments to the equipment.
8. Wear personal protective equipment (PPE), such as, but not limited to, protection for eyes, ears, lungs, head, hands and feet when operating, servicing, or repairing equipment. Avoid wearing loose clothing or jewelry that may catch and entangle on equipment moving parts.

THE LOADER

1. Read the loader operator's manual to learn how to operate your loader safely. Failure to do so could result in serious injury or death and equipment damage.
2. Become familiar with all the machine's controls and all the caution, warning and danger decals affixed to the machine before attempting to start or operate.
3. Improper use of a loader can cause serious injury or death.
4. Do not lift or carry anybody on the loader or in the bucket or attachment.
5. Never allow anyone to get under the loader bucket or reach through the booms when the bucket is raised.
6. Do not walk or work under a raised loader bucket or attachment unless it is securely blocked or held in position.
7. Avoid overhead wires and obstacles when loader is raised. Contacting electrical lines can cause electrocution.
8. Make sure all parked loaders on stands are on a hard, level surface.
9. Use a piece of cardboard or wood rather than hands and wear eye protection when searching for hydraulic leaks. Escaping hydraulic oil under pressure can penetrate skin. If oil is injected into skin, it must be surgically removed within a few hours by a doctor or gangrene may result.

SAFETY PRECAUTIONS CONTINUED

10. Before disconnecting hydraulic lines, relieve all hydraulic pressure.
11. Do not tamper with the relief valve setting. The relief valve is pre-set at the factory. Changing the setting can cause overloading the loader and tractor and serious operator injury may result.
12. Always wear safety goggles when repairing or servicing machine.
13. When servicing or replacing pins in cylinder ends, buckets, etc., always use a brass drift and hammer. Failure to do so could result in injury from flying fragments.
14. Replace damaged or illegible safety decals. See decal page for required decals.
15. Do not modify or alter or permit anyone else to modify or alter the loader, any of its components or any loader function without first consulting your local dealer.

OPERATING THE LOADER

1. It is the loader owner's responsibility to instruct and have a person read operator's manual, safety decals and become familiar with machine controls before allowing them to operate loader.
2. Do not allow children to operate the loader.
3. Before starting or operating the equipment, make a walk around inspection and check for loose or damaged components. Correct any deficiency before starting.
4. Keep the area of operation clear of all persons, particularly small children. The operator should cease operation whenever anyone comes within the operating area.
5. Operate the loader from the "Operator's Seat Only."
6. Exercise caution when operating the loader with a raised loaded bucket, fork, or large round hay bale handling attachments.
7. Avoid loose fill, rocks and holes. They can be dangerous for loader operation or movement.
8. Be extra careful when working on inclines.
9. Allow for the loader length when making turns.
10. Stop the loader arms gradually when lowering or lifting.
11. Use caution when handling loose or shiftable loads.
12. Carry loader arms at a low position during transport.
13. Lower loader arms, stop engine, and lock brakes before leaving the tractor seat.
14. Operate the loader controls only when properly seated at the controls.
15. Do not use loader for handling large, heavy objects such as logs, oil drums, etc.
16. Handling large, heavy objects is dangerous due to:
 - *Possibility of rolling the tractor over.
 - *Possibility of upending the tractor.
 - *Possibility of the object rolling or sliding down the loader arms onto the operator.
17. Use large round hay bale handler attachment with bale retaining devices (grapples, bale spears, clamps, etc.) to handle large round hay bales. Failure to use retaining devices could allow round hay bales to roll or fall down loader boom arms onto the operator causing serious injury or death and equipment damage.

IMPORTANT FEDERAL LAWS AND REGULATIONS* CONCERNING EMPLOYERS, EMPLOYEES AND OPERATIONS.

*(This section is intended to explain in broad terms the concept and effect of the following federal laws and regulations. It is not intended as a legal interpretation of the laws and should not be considered as such).

U.S. Public Law 91-596 (The Williams-Steiger Occupational and Health Act of 1970) OSHA

This Act Seeks:

“...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources...”

DUTIES

Sec. 5 (a) Each employer—

- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.
 - (b) Each employee shall comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA Regulations

Current OSHA regulations state in part: “At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved.” These will include (but are not limited to) instructions to:

Keep all guards in place when the machine is in operation;

Permit no riders on equipment;

Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning or unclogging the equipment, except where the machine must be running to be properly serviced or maintained, in which case the employer shall instruct employees as to all steps and procedures which are necessary to safely service or maintain the equipment.

Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine.

EMPLOYEE TRACTOR OPERATING INSTRUCTIONS:

1. Securely fasten your seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going, especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly - no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by tractor manufacturers.
9. When tractor is stopped, set brakes securely and use park lock if available.

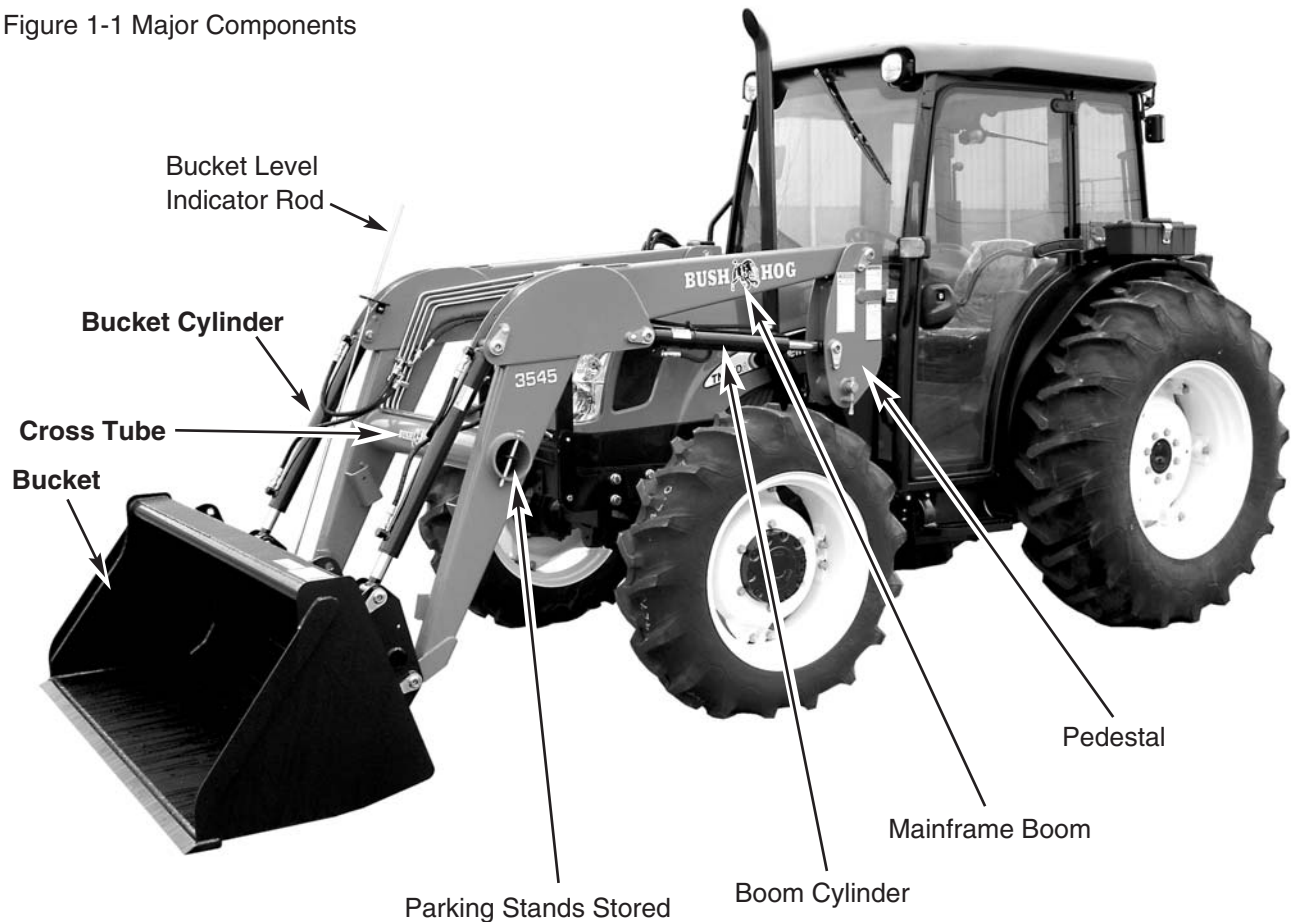
Child Labor Under 16 Years Old

Some regulations specify that no one under the age of 16 may operate power machinery. It is your responsibility to know what these regulations are in your own area or situation. (Refer to U.S. Dept. of Labor, Employment Standard Administration, Wage & Home Division, Child Labor Bulletin #102.)

SECTION I

INTRODUCTION AND DESCRIPTION

Figure 1-1 Major Components



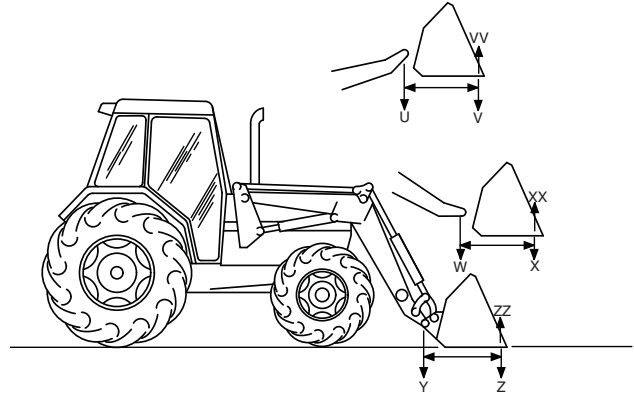
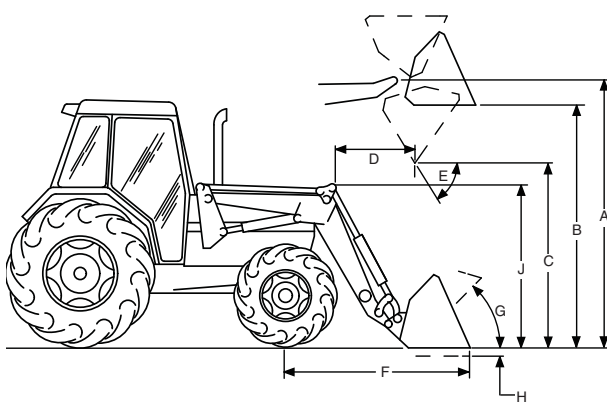
1-1 INTRODUCTION

We are pleased to have you as a Bush Hog customer. Your Front End Loader has been carefully designed to give maximum service with minimum down time. This manual is provided to give you the necessary operating and maintenance instructions for keeping your front end loader in top operating condition. Please read this manual thoroughly. Understand what each control is for and how to use it. Observe all safety precautions decaled on the machine and noted throughout the manual for safe operation of implement. If any assistance or additional information is needed, contact your authorized Bush Hog dealer.

1-2 DESCRIPTION

Model 3545/4045/5045/6045 Front End Loaders are designed for two wheel and four wheel drive tractors. They come equipped with parking stands to support the loader so the tractor can be "driven in" for quick attachment and a bucket level indicator that allows operator to gauge bucket position when the bucket cannot be seen. Available attachments include buckets for lifting loose materials; a bale spear for lifting round hay bales; and a fork lift for palletized material. All operations should be conducted within the loader limits specified in Table 1-1.

Table 1-1 TECHNICAL SPECIFICATIONS



SERIES LOADER	3545	4045	5045	6045
A. Maximum Lift Height - Measured at Pivot Pin	120"	126"	133"	153"
B. Maximum Lift Height - Under Level Bucket	110"	116"	123"	144"
C. Clearance with Attachment Dumped 45° 92 in.	90"	97"	105	125"
D. Reach at Maximum Height	23"	36"	30"	30"
E. Maximum Dump Angle	45°	45°	45°	42°
F. Reach with Bucket on Ground	77 in.	78 in.	75"	83"
G. Maximum Rollback Angle	25°	25°	25°	25°
H. Digging Depth	3.5 in.	3.5 in.	7"	6"
J. Overall Height in Carry Position	52 in.	63 in.	66"	76"
U. Lift Capacity to Maximum Height - At Pivot Pin	3000 lbs.	3500 lbs.	4000 lbs.	4950 lbs.
V. Lift Capacity to Maximum Height - 31.5" Forward of Pivot Pin	1950 lbs.	2200 lbs	2560 lbs.	3075 lbs.
W. Lift Capacity to 59" Height - At Pivot Pin	3900 lbs.	4100 lbs.	5000 lbs.	6500 lbs.
X. Lift Capacity to 59" Height - 31.5" Forward of Pivot Pin	2500 lbs.	2950 lbs.	3500 lbs.	4325 lbs.
Y. Breakout Force - At Pivot Pin	4300 lbs.	5000 lbs.	6000 lbs.	8450 lbs.
Z. Breakout Force - 31.5" Forward of Pivot Pin	2750 lbs.	3500 lbs.	4280 lbs.	5400 lbs.
VV. Rollback Force at Maximum Height - 31.5" Forward of Pivot Pin	3550 lbs.	5100 lbs.	4800 lbs.	5820 lbs.
XX. Rollback Force at 59" Height - 31.5" Forward of Pivot Pin	4050 lbs.	5300 lbs.	5600 lbs.	6180 lbs.
ZZ. Rollback Force at Ground Level - 31.5" Forward of Pivot Pin	3550 lbs.	3600 lbs.	3750 lbs.	3840 lbs.
Raising Time - Ground Level to Full Height	5 sec.	5 sec.	5 sec.	9 sec.
Lowering Time - Full Height to Ground	4 sec.	3 sec.	3 sec.	6 sec.
Bucket Dumping Time - Full Rollback to Full Dump	5 sec.	5 sec.	5 sec.	6 sec.
Bucket Rollback Time - Full Dump to Full Rollback	3 sec.	3 sec.	3 sec.	4 sec.
Tractor HP Range	40 - 60 2 & 4 WD	40 - 70 2 & 4 WD	60 - 90 2 & 4 WD	70 - 110 2 & 4 WD
Based On Tractor Hydraulic System: Pressure Flow	2850 psi 11 gpm	2850 psi 11 gpm	2850 psi 16 gpm	2850 psi 29 gpm

SECTION II

LOADER MOUNTING AND DISMOUNTING

2-1 PREPARING TRACTOR

CAUTION

TRACTORS THAT HAVE MOVABLE AXLES MUST BE SET FORWARD IN THE LONG WHEEL-BASE POSITION AS SHOWN IN FIGURE 2-1 TO PREVENT EXCESSIVE LEVERAGE BEING EXERTED ON THE TRACTOR FRAME. FAILURE TO DO SO CAN RESULT IN PERSONAL INJURY AND EQUIPMENT DAMAGE. REFER TO TRACTOR OPERATOR'S MANUAL FOR ABOVE PROCEDURES AND SPECIFICATIONS FOR YOUR TRACTOR.

A. Check air pressure in tractor tires to be sure it is adequate for heavy loads.

B. Add rear wheel weights, fluid in tires, or equivalent to provide sufficient tractor stability.

C. It is recommended that tractor wheels be moved to the widest settings.

D. Check tractor hydraulic oil reservoir to be sure it is full.

E. Refer to your tractor operator's manual for above procedures and specifications for your tractor.

2-2 MOUNTING LOADER

To aid in mounting and dismounting loader, apply a small amount of grease, if needed, to each loader bracket in area of top receiver and guide. Figure 2-2.

A. Slowly drive tractor to a position where the hoses can be connected to the quick couplers. Stop the engine. Connect the loader hydraulic hoses to the correct couplers. Figure 2-3.

B. Retract Loader Lift Cylinders. Figure 2-3.

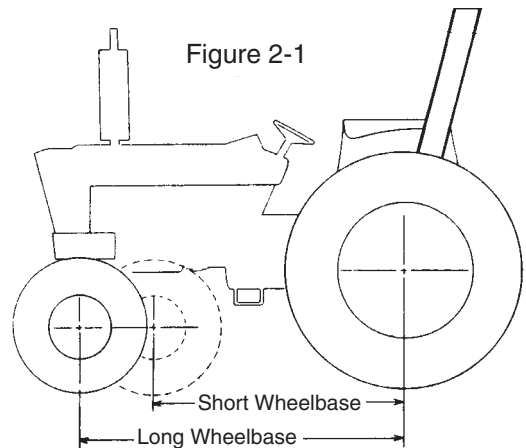


Figure 2-2 Apply Grease To These Areas

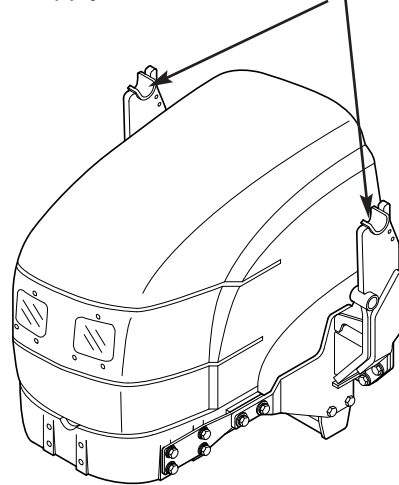


Figure 2-3 Drive In Close Enough To Allow Connecting Hydraulic Hoses To Tractor Outlets



C. Check that lift cylinders are fully retracted. Figure 2-3. Then drive tractor forward. Use bucket cylinders to position height of outer pedestal top pin. Figure 2-4.

Figure 2-4 Outer Pedestal Top Pin



D. Align outer pedestal top pin with mounting bracket guide post on both sides. Make sure loader is centered right to left on both brackets.

E. Extend the bucket cylinders to lower the pedestal top pins into mounting bracket receivers on both sides.

F. Extend lift cylinders slowly making sure loader is seated completely in mounting bracket top and bottom receivers. Retract bucket cylinder until bucket is approximately 1/2" off ground.

G. Slide quick pin into position and let pin handle extend downward through the retaining loop at the bottom of the subframe. Figures 2-5 and 2-6

Figure 2-5 Quick Pin



Figure 2-6 Pin In Operating Position



H. Remove parking stands from the parked position and return them to their storage positions in the cross tube. Figure 2-7

Figure 2-7 Storing Parking Stand



Secure parking stands in the storage position by using the provided pins. Figure 2-8

Figure 2-8 Parking Stand Stored



I. Lower loader to ground and secure loader hydraulic hoses in a protected area.

IMPORTANT

To avoid hydraulic hose damage, be alert and make sure hoses do not catch on tractor and/or loader during mounting or dismounting.

2-3 DISMOUNTING LOADER

CAUTION

ALWAYS PARK LOADER WITH MATERIAL BUCKET OR AUTHORIZED BUSH HOG ATTACHMENT ATTACHED TO THE LOADER.

CAUTION

BEFORE LEAVING THE TRACTOR SEAT, LOWER ATTACHMENT OR LOADER BOOM TO GROUND, STOP ENGINE, LOCK BRAKES, RELIEVE HYDRAULIC PRESSURE, AND REMOVE KEY.

CAUTION

DO NOT STAND, WALK, OR WORK UNDER A RAISED LOADER OR ATTACHMENT UNLESS IT IS SECURELY BLOCKED OR HELD IN POSITION. ACCIDENTAL MOVEMENT OF A CONTROL LEVER/LEVERS OR LEAKS IN THE HYDRAULIC SYSTEM COULD CAUSE THE LOADER TO DROP, OR ATTACHMENT TO DUMP, CAUSING SEVERE INJURY.

CAUTION

DO NOT ALLOW BYSTANDERS IN LOADER AREA.

IMPORTANT

Never allow weight of tractor to be placed on parking stands when mounting or dismounting loader.

A. Position the loader on a hard level surface. The more level the surface, the easier the loader is to mount and dismount.

B. Raise loader, dump bucket over, and then lower loader so that bucket cutting edge is approximately 1/2" off of surface.

C. Remove parking stands from their storage positions in the boom crosstube as shown in Figure 2-8.

D. Position parking stands in attaching brackets on inside of each loader arm and secure. Figure 2-9.

E. Dismounting procedures will be the reverse of the mounting procedure.

F. Rollback bucket slightly while lowering loader boom down until the parking stands make firm contact with ground. Dump bucket until bucket touches the surface.

NOTE

Driving the tractor forward slowly while positioning loader will allow parking stands to contact ground firmly.

Figure 2-9 Parking Stand Installed



Attaching Bracket Long End Positioned Rearward

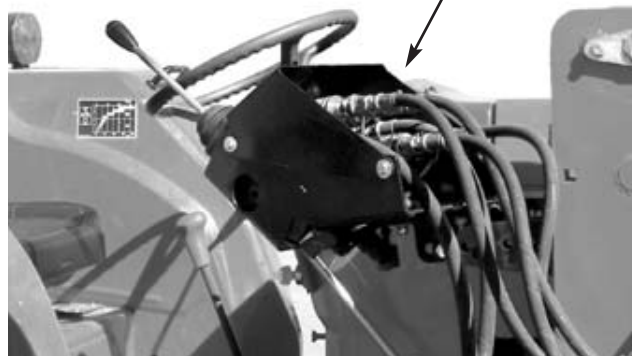
G. Retract loader lift cylinders

H. Slowly rollback bucket while driving slightly forward with tractor. Doing this will allow mounting brackets to guide loader as loader is being parked off of tractor.

I. Rollback bucket completely. Make sure all loader components clear tractor. Stop the tractor engine and then work valve control lever/levers to relieve hydraulic fluid pressure in lines. Refer to tractor operator manual for additional information.

J. Disconnect loader hoses from quick couplers. Start tractor and slowly back tractor away from loader. Figures 2-10, 2-11, 2-12

Figure 2-10 Hydraulic Hoses - Quick Couplers



IMPORTANT

To avoid hydraulic hose damage, be alert and make sure hoses do not catch on tractor and/or loader during mounting or dismounting.

Figure 2-11 Preparing To Disconnect Hydraulics



⚠ WARNING

MAKE SURE PARKED LOADER IS ON A HARD LEVEL SURFACE. ENGAGE ALL SAFETY DEVICES TO PREVENT LOADER FROM FALLING AND BEING DAMAGED OR INJURING SOMEONE. DO NOT REPAIR LOADER IF IT IS NOT MOUNTED ON THE TRACTOR. LOSS OF HYDRAULIC FLUID OR REMOVAL OF PARTS COULD CAUSE LOADER TO COLLAPSE RESULTING IN INJURY.

Figure 2-12 Tractor Backed Away From Loader



SECTION III OPERATING INSTRUCTIONS

3-1 GENERAL SAFETY

Only qualified people familiar with this operator's manual should operate this machine. Operator should wear hard hat, safety glasses, and safety shoes. The operator should read, understand and practice all safety messages shown on the caution, warning and danger decals affixed to the loader to avoid serious injury or death. It is recommended that tractor be equipped with Rollover Protective System (ROPS) and a seat belt be used. Check for ditches, stumps, holes or other obstacles that could upset tractor or damage loader. Always turn off tractor engine, set parking brake, and lower loader to ground before leaving tractor operator's seat.

3-2 PRE-OPERATION

IMPORTANT

Do not extend bucket cylinders without quick hitch attachment installed on loader. Failure to follow these instructions could cause bucket cylinder damage and will void loader warranty.

NOTE

Check the tractor hydraulic fluid reservoir and fill, if required.

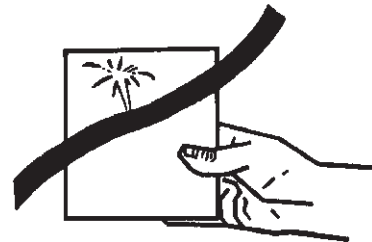
3-3 INITIAL LOADER OPERATION

NOTE

Keep engine speed at low idle during the initial loader operation.

⚠ WARNING

ESCAPING HYDRAULIC FLUID UNDER PRESSURE CAN HAVE SUFFICIENT FORCE TO PENETRATE SKIN, CAUSING SERIOUS PERSONAL INJURY. BEFORE APPLYING PRESSURE TO SYSTEM, BE SURE ALL CONNECTIONS ARE TIGHT AND THAT LINES, TUBES, AND HOSES ARE NOT DAMAGED. FLUID ESCAPING FROM A VERY SMALL HOLE CAN BE ALMOST INVISIBLE. USE A PIECE OF CARDBOARD OR WOOD, RATHER THAN HANDS, TO SEARCH FOR SUSPECTED LEAKS. IF INJURED BY ESCAPING FLUID, SEE A DOCTOR AT ONCE. SERIOUS INFECTION OR REACTION CAN DEVELOP IF PROPER MEDICAL TREATMENT IS NOT ADMINISTERED IMMEDIATELY.



3-4 EXTERNAL LOADER AND/OR TRACTOR VALVE.

NOTE

When properly installed, the tractor remote valve or external valve control lever/levers will control the loader hydraulic circuits as described below. Refer to tractor Operator's Manual for further explanation of tractor remote control lever/levers.

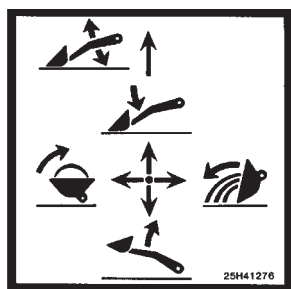
IMPORTANT

Contaminants in hydraulic fluid can cause valve spools to stick. BE ALERT when operating loader and follow your tractor Operator's Manual hydraulic fluid maintenance schedule.

3-5 LOADER MOUNTED CONTROL VALVE EQUIPPED WITH SINGLE LEVER CONTROL HANDLE OR TRACTOR REMOTE VALVE EQUIPPED WITH SINGLE LEVER CONTROL HANDLE

If your loader utilizes a loader control valve equipped with single lever control handle or tractor remote valve equipped with single lever control handle, it will function as shown in Figure 3-1.

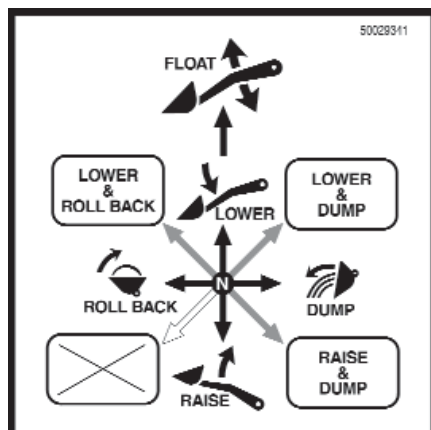
Figure 3-1



3-6 LOADER MOUNTED SERIES CONTROL VALVE EQUIPPED WITH SINGLE LEVER CONTROL HANDLE

If your loader utilizes a loader mounted series control valve equipped with single lever control handle, it will function as shown in Figure 3-2.

Figure 3-2



3-7 NEUTRAL POSITION

The loader external valve provided by Bush Hog has a "neutral position" which prevents movement of the loader or attachment. When the control handle is manually released from the work position, the valve spool will return to the neutral position.

3-8 FLOAT POSITION

The loader external valve provided by Bush Hog has a "float position" incorporated into the lift cylinder circuit which allows the loader to float. This float feature is important for satisfactory operation when scraping, sweeping, leveling, or any job where it is necessary to follow the contour of the surface. To activate the float position, lower the bucket or attachment and push the control handle all the way forward into detent. The valve will stay in float detent position until the operator manually pulls the control handle out of detent position to deactivate float.

3-9 REGENERATIVE VALVE POSITION

When the handle is pushed all the way to the right, it will go past the dump detent position into the regenerative position. This position requires the operator to hold it in place. This feature enhances the performance and speed of the dump procedure.

3-10 LOAD SENSE LOADER VALVE

IMPORTANT

If your loader is equipped with a load sense type control valve it may demonstrate the following operation characteristic. Attempting to raise the boom by finely feathering the control lever may actually allow the boom to lower very slowly. To prevent this from happening, move the control lever far enough to ensure that the boom raises.

3-11 LOADER OPERATION

Before operating the loader, fully raise and lower the boom three or four times. Then raise the loader bucket approximately four (4) feet above the ground and cycle the bucket two or three times. Lower the bucket or attachment to the ground. Check the tractor hydraulic fluid level and fill as required. Refer to the tractor Operator's Manual for the proper hydraulic fluid and the correct hydraulic fluid level.

CAUTION

BEFORE LEAVING THE TRACTOR SEAT, LOWER ATTACHMENT OR LOADER BOOM TO GROUND, STOP ENGINE, LOCK BRAKES, RELIEVE HYDRAULIC PRESSURE, AND REMOVE KEY.

IMPORTANT

Always keep the cylinders in a retracted position when the loader is not in use to guard against rust and contamination which may cause damage to the cylinder rods and hydraulic system.

3-12 REMOVING AIR FROM HYDRAULIC SYSTEM

Repeat raising and lowering the loader boom and bucket operations until all the air is removed from the system and the system responds properly.

3-13 HOSE IDENTIFICATION

Metal lines on the loader are color coded. Check loader functions. Refer to instruction sheets for hydraulic valve option on your loader.

3-14 BUCKET LEVEL INDICATOR ROD

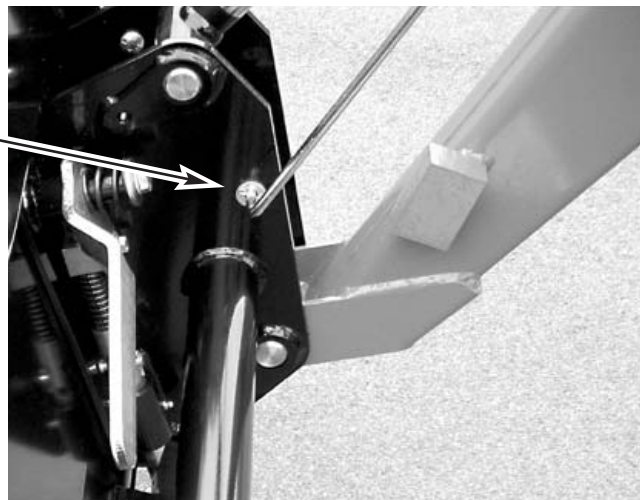
A bucket level indicator rod (Figure 3-3), located on the bucket cylinder, can be used to determine bucket angle. Before beginning work, observe the position of indicator rod with the bucket flat on the ground. The “kink” in the indicator rod should be located in the bracket slot. If the kink is not in centered in the slot, readjust the bracket. Refer to the assembly instructions. Raise boom to several different positions and operate the bucket cylinders. Observe the indicator rod. Once familiar with the indicator rod positions, operation of the loader will be easier and more efficient.

The text and illustrations on the following pages offer suggested loader and tractor operating techniques.

Figure 3-3
Bucket Level Indicator Rod Showing That The Bucket Is Resting Flat On The Surface

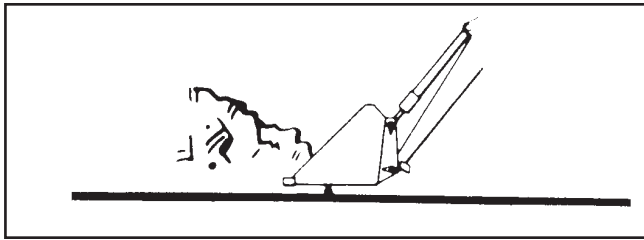


Indicator Rod
Lower Mounting Location

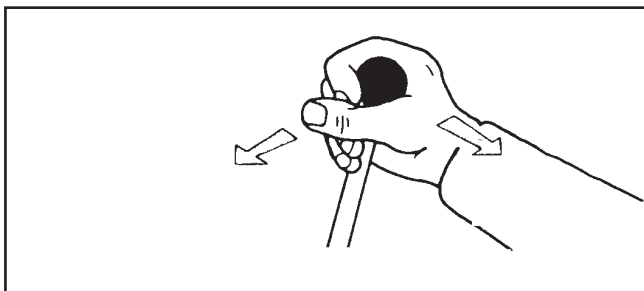


FILLING THE BUCKET

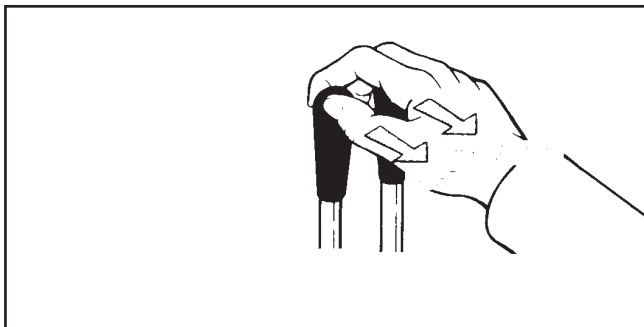
Approach and enter the pile with a level bucket.



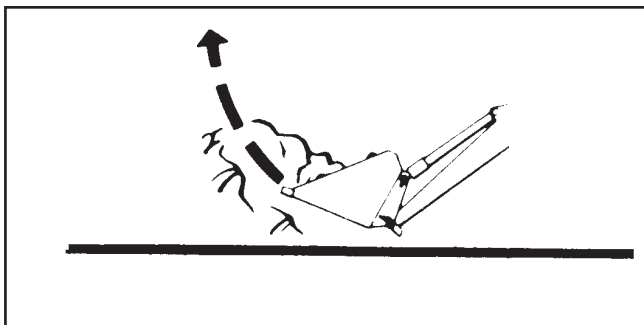
Loaders with 1-lever control, ease lever back and toward you to lift and rollback the bucket.



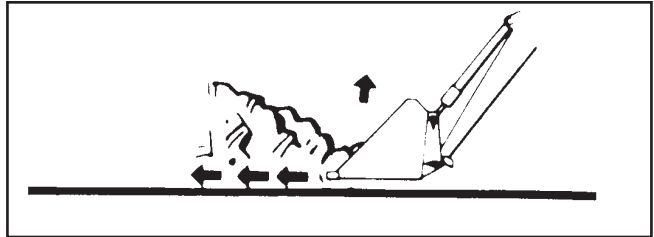
Loaders with 2-lever controls, ease both levers back to lift and rollback the bucket.



The lift and rollback of the bucket will increase efficiency because...



...a level bucket throughout the lifting cycle resists bucket lift and increases breakaway effort.



NOTE; Do not be concerned if the bucket is not completely filled during each pass. Maximum productivity is determined by the amount of material loaded in a given period of time. Time is lost if two or more attempts are made to fill the bucket on each pass.

LIFTING THE LOAD

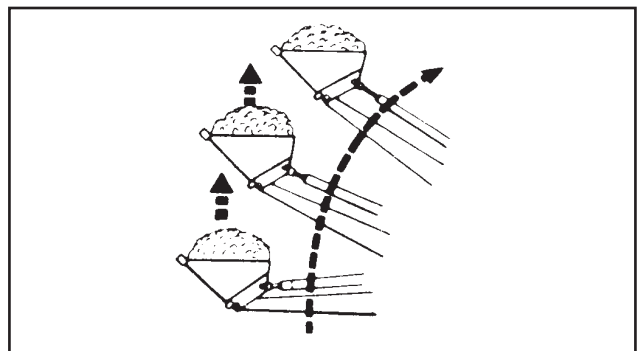
⚠ WARNING

DO NOT LIFT OR CARRY ANYONE IN THE BUCKET OR ON ANY OTHER PORTION OF THE LOADER OR LOADER ATTACHMENT. INADVERTENT MOVEMENT OF THE LOADER OR ATTACHMENT COULD RESULT IN SERIOUS INJURY OR DEATH FROM FALLING OR CRUSHING.

⚠ CAUTION

MAKE SURE MATERIAL IN BUCKET CANNOT ROLL OUT AND DOWN ON TRACTOR WHEN BUCKET IS RAISED TO FULL HEIGHT. KEEP CLEAR OF OVERHEAD OBSTRUCTIONS SUCH AS TREES, LIMBS OR POWER LINES WHEN RAISING THE BUCKET

When lifting the load, keep the bucket positioned to avoid spillage.

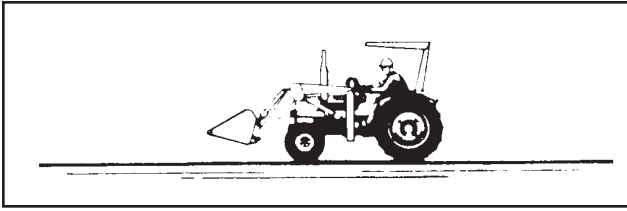


⚠ CAUTION

DO NOT ATTEMPT TO LIFT BUCKET LOADS IN EXCESS OF CAPACITIES LISTED IN TABLE 1-1 TECHNICAL SPECIFICATIONS.

CARRYING THE LOAD

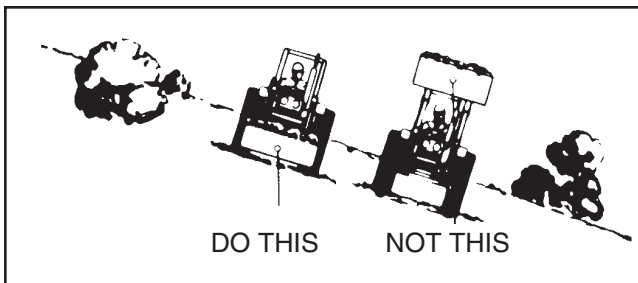
Position the bucket as low as possible below the level of the tractor hood for maximum stability and visibility, whether the bucket is loaded or empty.



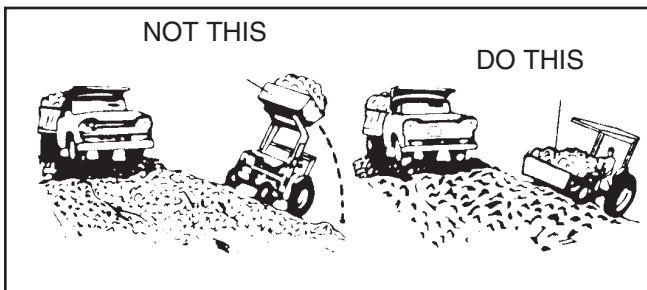
Use extreme caution when operating the loader on a slope and keep the bucket as low as possible. This keeps the bucket and tractor center of gravity low and will provide maximum tractor stability.



CAUTION
OPERATING THE LOADER ON A HILLSIDE
IS DANGEROUS. EXTREME CARE IS
RECOMMENDED.

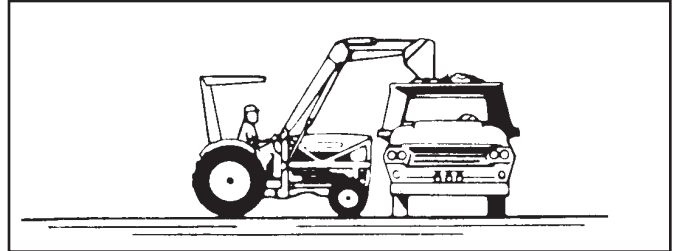


When transporting the load, keep the bucket as low as possible to avoid tipping, in case a wheel drops in a rut.



DUMPING THE BUCKET

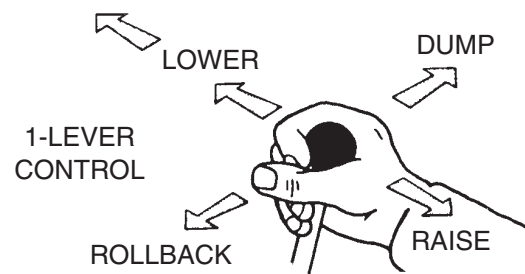
Lift the bucket high enough to clear the side of the vehicle. Move the tractor in as close to the side of the vehicle as possible, then dump the bucket.



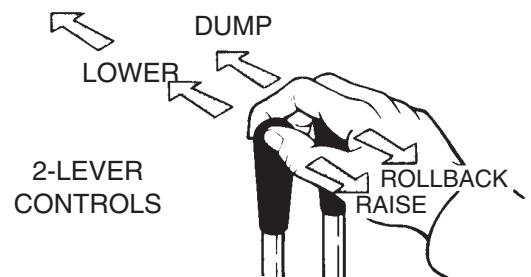
LOWERING THE BUCKET

After the bucket is dumped, back away from the vehicle while lowering and rolling back the bucket.

FLOAT POSITION

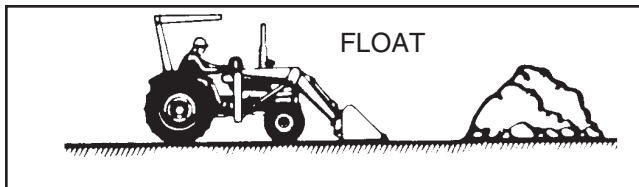


FLOAT POSITION

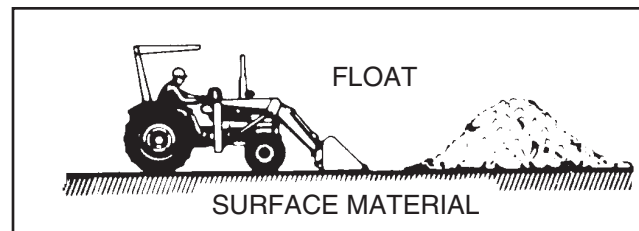


OPERATING WITH FLOAT CONTROL

During hard surface operation, keep the bucket level and put the lift control in the float position to permit the bucket to float on the working surface. If hydraulic down pressure is exerted on the bucket, it will wear faster than normal.

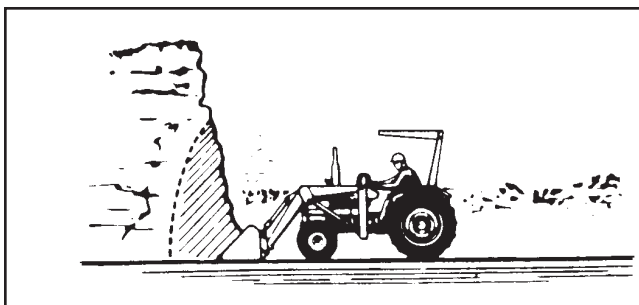


The float will also prevent the mixing of surface material with stockpile material. The float position will reduce the chance of surface gouging when removing snow or other material.

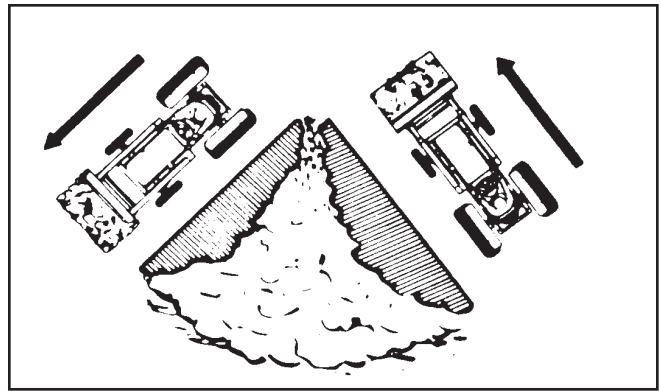


LOADING FROM A BANK

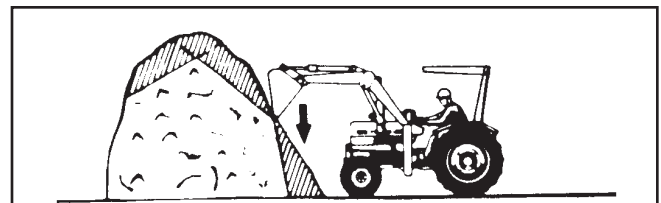
Choose a forward gear that provides sufficient ground speed for loading



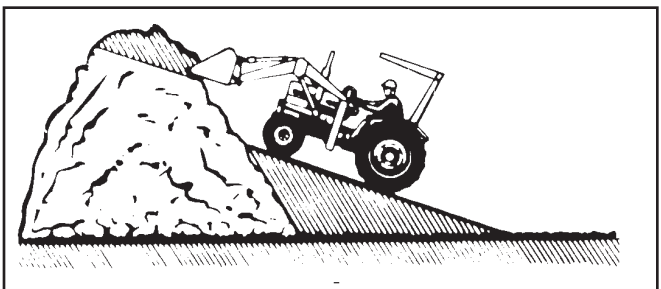
Exercise caution when undercutting high banks. Dirt slides can be dangerous. Load from as low as possible for maximum efficiency. Loader lift and break-away capacity diminish as loading height is increased.



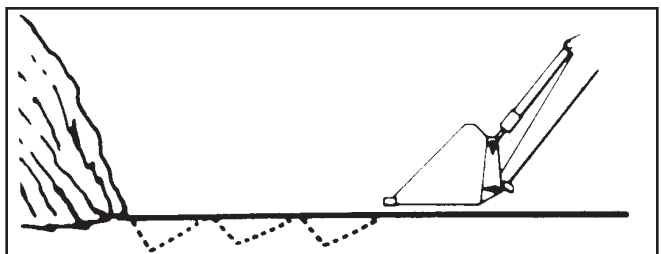
Sidecutting is a good technique for cutting down a big pile.



If the piles are too high and liable to cause cave-in, use the loader to break down the sides until a slot can be cut over the top.

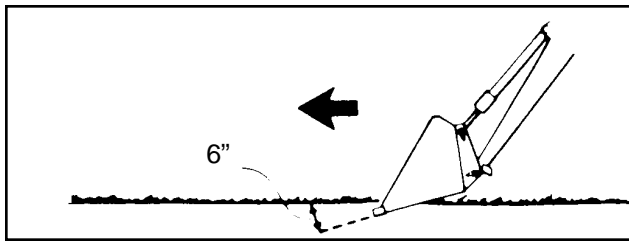


Another method for large dirt piles is to build a ramp approach to the pile.

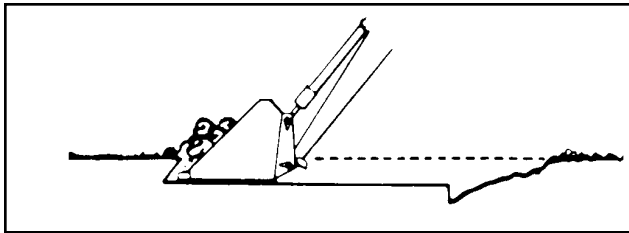


It's important to keep the bucket level when approaching a bank or pile. this will help prevent gouging the work area.

PEELING AND SCRAPING

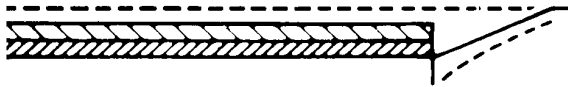


Use a slight bucket angle, travel forward, and hold the lift control forward to start the cut. Make a short, angle cut approximately 6" deep and break-out cleanly.



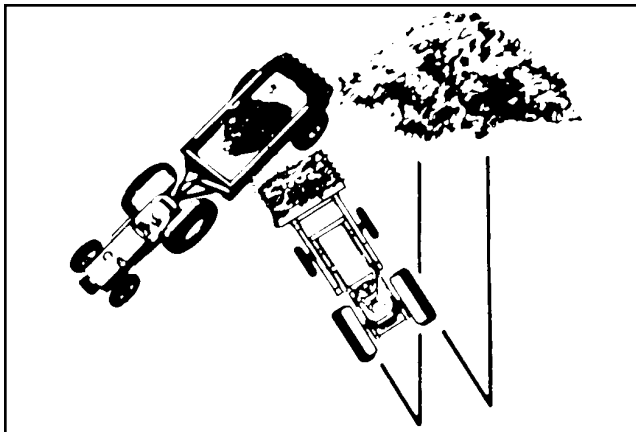
With the bucket level, start a cut at the notch approximately 2" deep. Hold the depth by feathering the bucket control to adjust the cutting lip up or down. When the front tires enter the notch, adjust the lift cylinder to maintain proper depth.

3RD CUT , 4TH CUT, ETC.



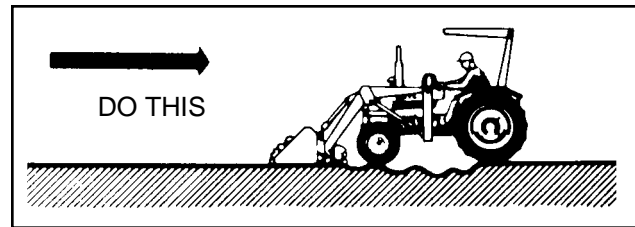
Make additional passes until the desired depth is reached. During each pass, only use the bucket control while at working depth. This will allow you to concentrate on controlling the bucket angle to maintain a precise cut.

LOADING LOW TRUCKS OR SPREADERS FROM A PILE

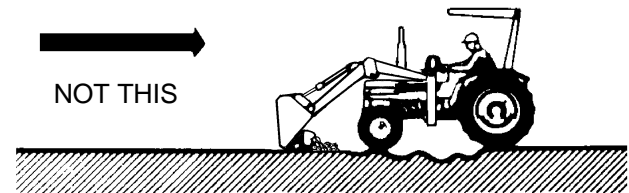


For faster loading, minimize the angle of turn and length of run between pile and spreader.

BACKFILLING



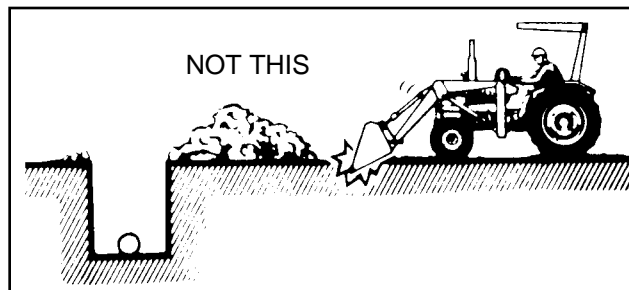
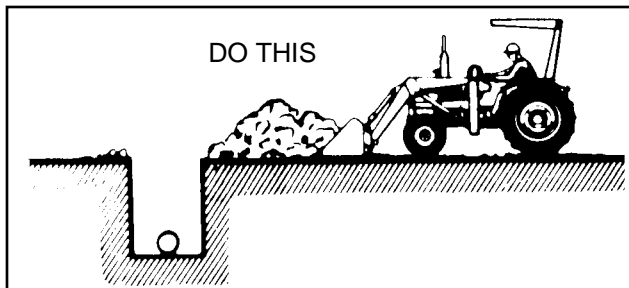
Backgrade occasionally with a loaded bucket to keep the working surface free of ruts and holes. Hold the lift control forward in **float position so the full weight** of the bucket is scraping the ground. Use only the heel of the bucket while backgrading.



IMPORTANT: To prevent damage to cylinders:

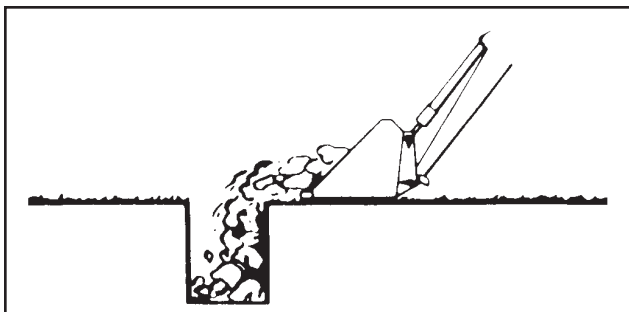
- (1) Do not backgrade with bucket cylinders extended.
- (2) Always backgrade with valve in **float position**.

Approach the pile with a flat bucket.

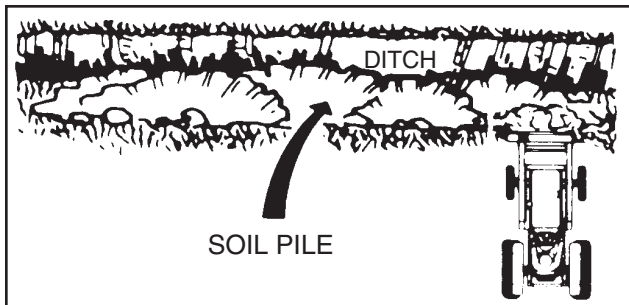


Poor methods actually move no more dirt and make it more difficult to hold a level grade.

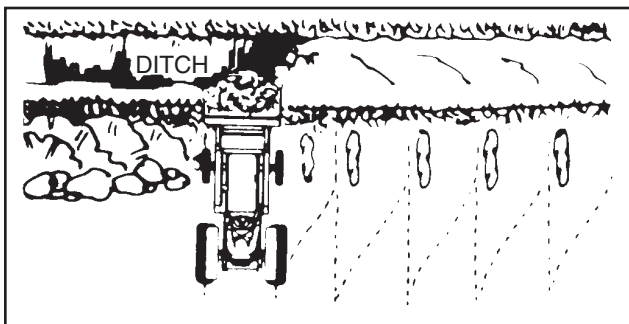
Do not use the bucket in the dumped position for bulldozing or backgrading. This method, shown above, will impose severe shock loadings on the dump linkage, the bucket cylinder, and the tractor.



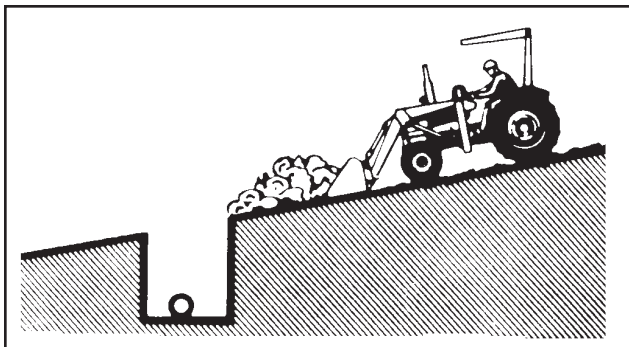
Leave dirt in the bucket because dumping on each pass wastes time.



Operate at right angles to the ditch. Take as big a bite as the tractor can handle without lugging down.



Leave dirt which drifts over the side of the bucket for final clean-up.



Pile dirt on the high side for easier backfilling on a slope.

HANDLING LARGE HEAVY OBJECTS

WARNING

Do not use front end loaders for handling large heavy objects such as logs or oil drums. Handle large round hay bales only when loader is equipped with Bush Hog Bale Spear Attachment.

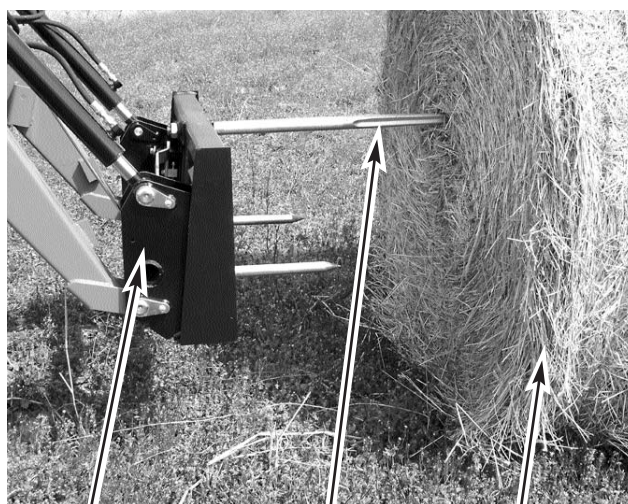
Handling large heavy objects can be extremely dangerous due to:

- ★ Possibility of rolling the tractor over.
- ★ Possibility of upending the tractor.
- ★ Possibility of the object rolling or sliding down the loader arms onto the operator.

3-15 BALE SPEAR OPERATION

The bale spear (Figure 3-4) is intended for handling large round bales. Before operation, set tractor wheels to tractor manufacturer's widest recommended settings and add ballast as necessary to provide adequate stability for handling round bales. It is recommended that tractor be equipped with a ROPS and seat belts. Approach bale from downhill side with tractor in low gear. **Run spears all the way into bale with long spear as close to center as possible. Lift bale just high enough for adequate ground clearance to transport, maintaining good visibility. Always carry load as low as possible when transporting, for improved stability. Use low gear on downhill grades. Unload round bales on a level surface.**

Figure 3-4 Bale Spear



Quick Hitch

Long Spear

Round Bale

3-16 FORK LIFT OPERATION

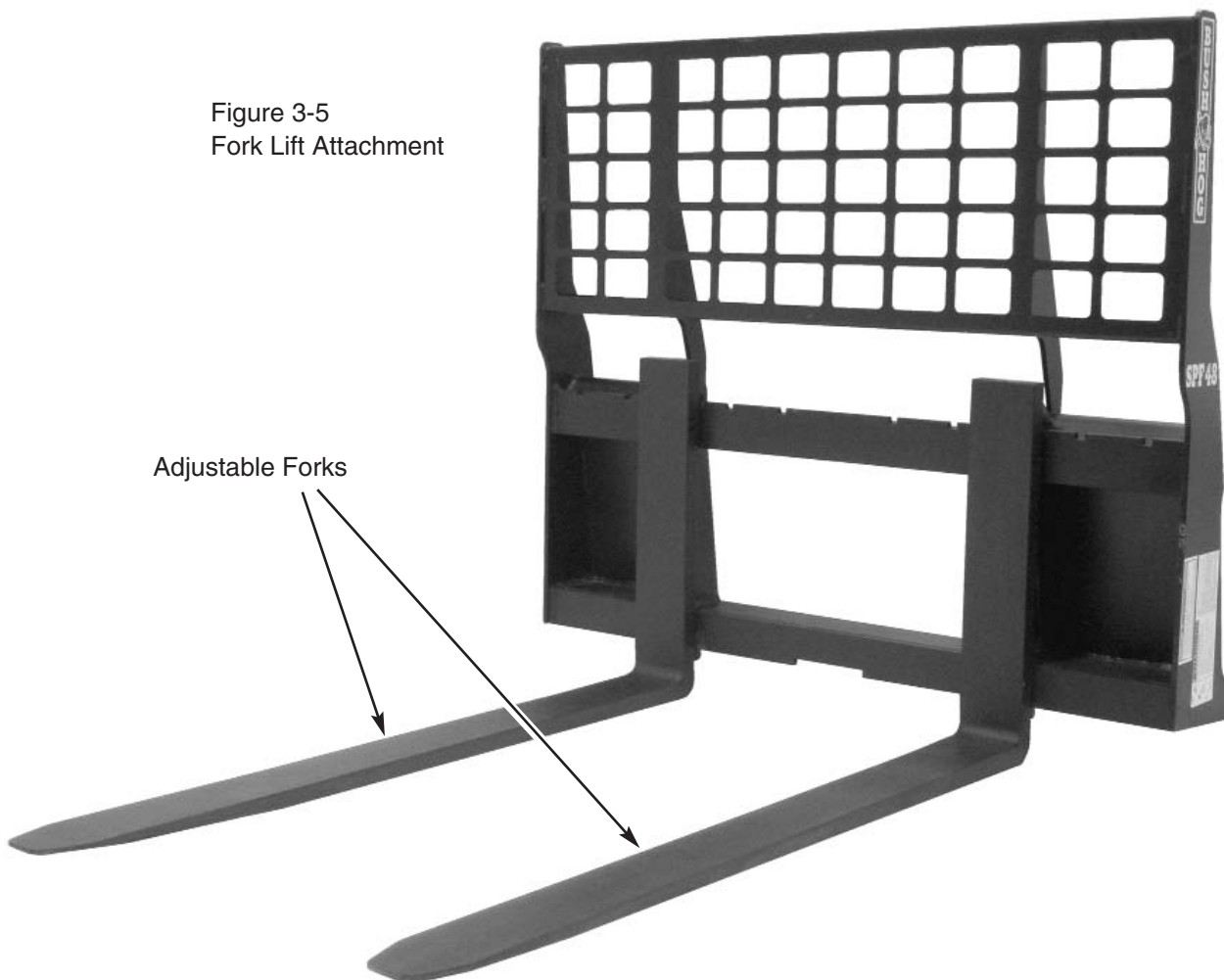
WARNING

TO AVOID SERIOUS INJURY OR DEATH:

- ★ NEVER LIFT LARGE ROUND HAY BALES OR OTHER LOADS ON THE FORK LIFT ATTACHMENT THAT COULD ROLL BACK ONTO TRACTOR OPERATOR AREA.
- ★ NEVER USE FORK LIFT ATTACHMENT TO LIFT OR SUPPORT PEOPLE.
- ★ TRANSPORT LOADS LOW AND SLOW.
- ★ AVOID CONTACT WITH POWER LINES.

The fork lift attachment (Figure 3-5) is intended for handling palletized material. It is recommended that tractor be equipped with ROPS and seat belts. Use the loader dump cylinders to give the forks the desired tilt. Position the forks on their support rods to the desired width so that the load will be carried approximately equal on each fork. Position load as far back as possible.

Figure 3-5
Fork Lift Attachment



CAUTION

ALWAYS CHECK TO INSURE THAT QUICK HITCH PINS ARE IN THE LATCHED POSITION BEFORE OPERATING LOADER OR ACCIDENTAL DISENGAGEMENT OF THE ATTACHMENT COULD RESULT.

3-17 TRANSPORTING

When transporting on road or highway, day or night, use tractor flashing warning lights unless prohibited by law. Carry load as low as possible maintaining adequate ground clearance and good visibility. Reduce tractor ground speed when carrying a load. Take extra care when traveling over rough terrain or on slopes.

CAUTION

WHEN TRANSPORTING A LOAD, KEEP THE ATTACHMENT AS LOW AS POSSIBLE TO RESIST TIPPING IN CASE A WHEEL DROPS IN A RUT.

3-18 SKID STEER QUICK HITCH OPERATION

The quick hitch (Figure 3-6) is designed to allow easy mounting and dismounting of skid steer attachments from loader. With attachment on flat, level surface, mount as follows:

Tilt quick hitch slightly forward at top and slowly drive into attachment.

Hook quick hitch under top cuff on attachment and lift off ground using boom cylinders only.

Tilt quick hitch backward using bucket cylinder so that bottom of attachment will swing into position.

Rotate handles downward, locking spring-loaded pins into place in slot on attachment hitch for operation.

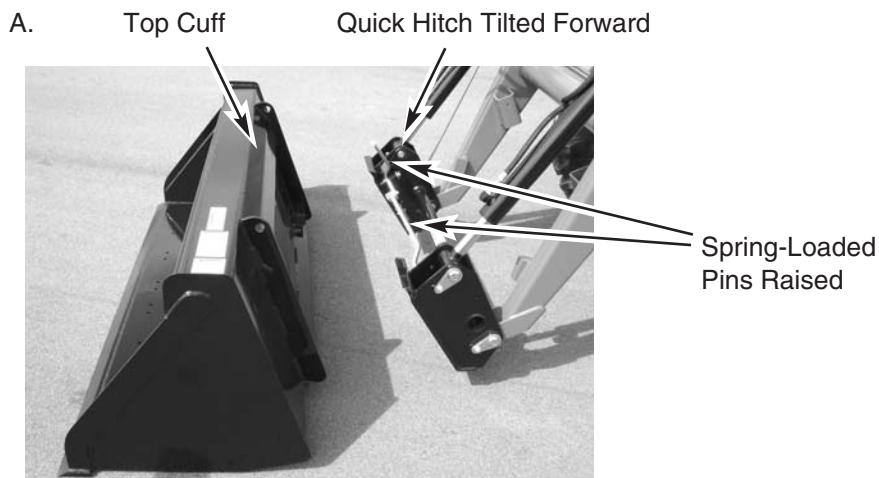
To dismount the attachment:

Tilt quick hitch backward and rotate handles up to disengage pins. Reverse the mounting procedure.

CAUTION

ALWAYS CHECK TO INSURE THAT QUICK HITCH PINS ARE IN THE LATCHED POSITION BEFORE OPERATING LOADER OR ACCIDENTAL DISENGAGEMENT OF THE ATTACHMENT COULD RESULT.

Figure 3-6 A, B, C, & D
Quick Hitch Operation



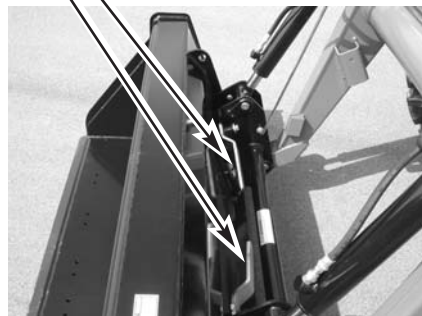
B. Drive Into Attachment



C. Raise And Roll Back Attachment



D. Lower Spring-Loaded Pins



SECTION IV MAINTENANCE

4-1 MAINTENANCE CHECK LIST

Perform scheduled maintenance as outlined below. Lower machine to ground, turn off tractor, and set parking brake before doing maintenance inspections or work. All bolts should be torqued as recommended in torque chart unless otherwise indicated.

WARNING

THE LOADER CAN FALL FROM HYDRAULIC SYSTEM FAILURE. TO AVOID SERIOUS INJURY OR DEATH, SECURELY SUPPORT LOADER BEFORE WORKING UNDERNEATH.

BEFORE EACH USE

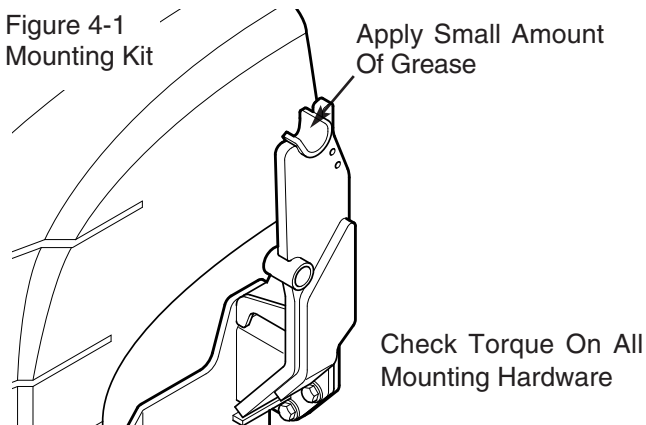
1. Inspect hydraulic lines and fittings for wear or leaks. Repair or replace if needed.
2. Inspect all pivot pins for wear. Make certain carriage bolts, lockwashers and hex nuts are installed to retain each pivot pin.
3. **Check all bolts for tightness.**
4. Perform BEFORE EACH USE lubrication per paragraph 4-2.
5. During operation, listen for abnormal sounds which might indicate loose parts or other damage.

AFTER EACH USE

1. Clean all debris from machine, especially cylinder rods and affixed safety decals. Replace any missing or illegible decals.
2. Inspect loader for worn or damaged components. Repair or replace before next use. Any replacement components installed during repair shall include the components' current safety decals specified by the manufacturer to be affixed to the component.
3. Store loader in a dry place.

To keep mounting kit hardware from loosening during operation, periodically check that all loader mounting kit hardware is torqued to specifications noted in torque chart, Page 33. To aid in mounting and dismounting loader, apply a small amount of grease to areas shown in Figure 4-1.

Figure 4-1
Mounting Kit



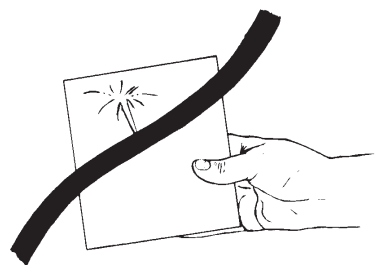
4-2 LUBRICATION (Figure 4-2)

NOTE

The multi-purpose grease referenced in this section is an NLGI grade 2 type grease.

BEFORE EACH USE

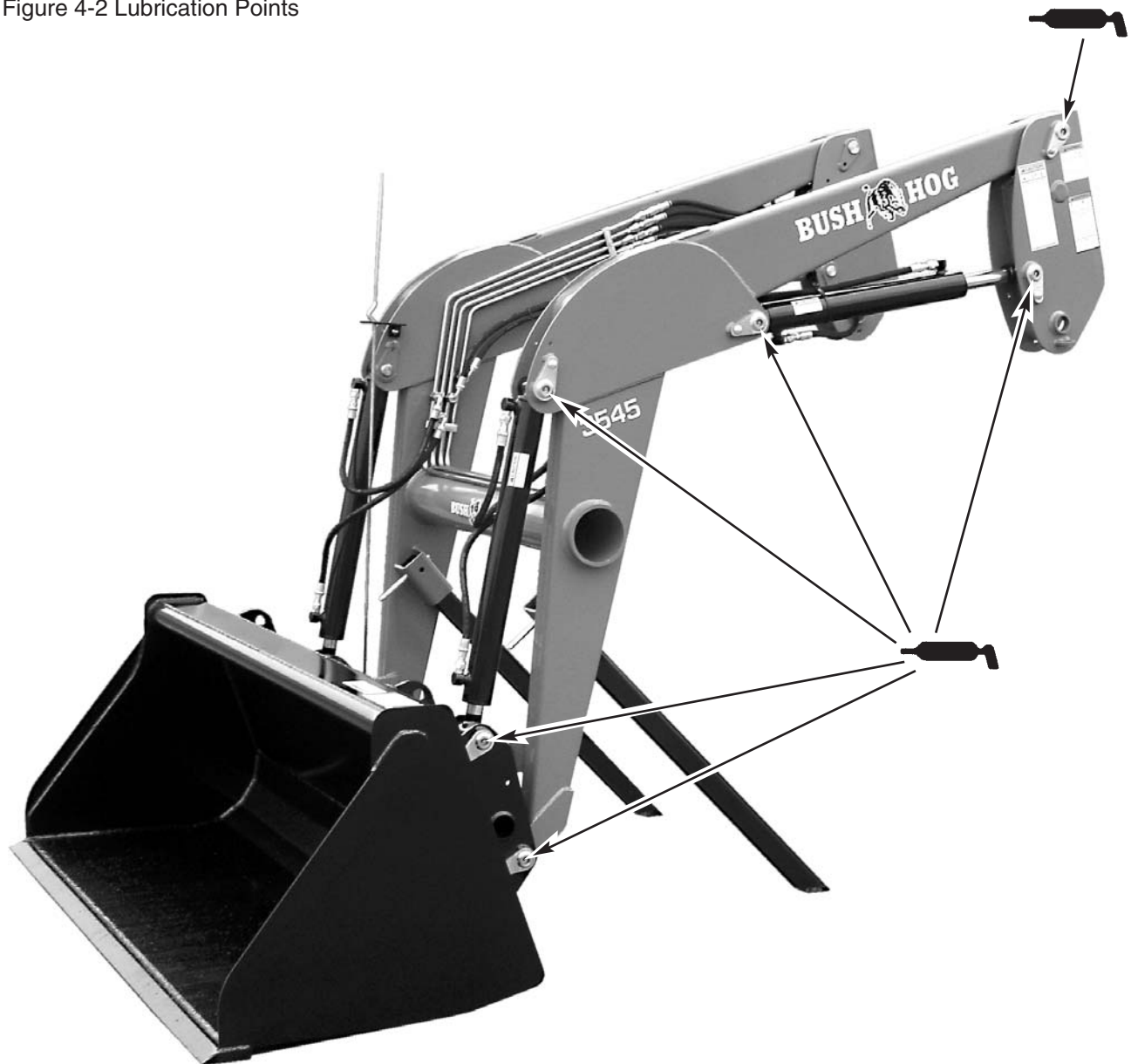
1. Pivot Pins - Apply multi-purpose grease to each fitting.
2. Hydraulic Oil - Cycle boom and bucket cylinders 2 or 3 times before each use, then check hydraulic oil level in tractor reservoir.



CAUTION

USE A PIECE OF CARDBOARD OR WOOD RATHER THAN HANDS AND WEAR EYE PROTECTION WHEN SEARCHING FOR HYDRAULIC LEAKS. ESCAPING HYDRAULIC OIL UNDER PRESSURE CAN PENETRATE SKIN. IF OIL IS INJECTED INTO SKIN, IT MUST BE SURGICALLY REMOVED WITHIN A FEW HOURS BY A DOCTOR OR GANGRENE MAY RESULT.

Figure 4-2 Lubrication Points



4-3 HYDRAULIC SYSTEM PRESSURE REQUIREMENTS

A tractor hydraulic system pressure setting of 2500 psi is recommended for maximum efficiency and service. **Do not exceed 3000 psi as this will damage components possibly causing serious injury.** The Bush Hog control valve is pre-set at the factory and should not be adjusted.

4-4 TROUBLESHOOTING

Troubleshooting procedures are listed in Table 4-1. If the problem cannot be solved or replacement parts are necessary, contact your authorized Bush Hog dealer. Please have ready your machine name, model number, serial number, purchase date and exact cause or description of problem.

TABLE 4-1 TROUBLESHOOTING PROCEDURES

PROBLEM	POSSIBLE CAUSE	REMEDY
Loader slow and/or will not dump.	Hydraulic oil viscosity too heavy. Oil filter plugged. Hydraulic pump worn. Oil line restricted or leaking. Quick couplers not properly connected. Control valve does not shift properly. Air in hydraulic system. Cylinder leaks internally. Faulty valve.	Change to proper oil. Clean or replace filter. Repair or replace pump. Check all hoses and tubes for leaks, damage or restrictions. Replace damaged or restricted hoses or tube lines. Check connection - Replace if necessary. Inspect clean, repair or replace valve. Cycle lift cylinders and bucket cylinders several times to free system of air. Replace seals. Repair or replace valve.
Loader chatters or vibrates when raising or lowering.	Air in hydraulic system. Oil level too low.	Cycle lift cylinders and bucket cylinders. Add oil as required.
Oil leaks.	Damaged fittings or hoses. Loose connections. Worn or damaged O-ring or wiper seal in cylinder rod end. Worn or damaged O-rings in valve.	Replace damaged parts. Tighten fittings. Install a seal repair kit. Install an O-ring repair kit.
Insufficient lift capacity.	Load is greater than boom lift capacity. Internal boom cylinder leakage. Improper hydraulic valve operation.	Check loader specifications. Check tractor system. Replace any worn parts and install a seal repair kit. Repair or replace valve.
Slow leakdown.	Worn control valve. Worn cylinder piston seals.	Have authorized Bush Hog dealer replace seals. Have authorized Bush Hog dealer replace seals.
Excessive wear on bottom of bucket and wear pads.	Float position not used while operating loader.	Use float position provided on valve.
Hydraulic cylinders inoperative.	Hose from control valve improperly connected.	Refer to plumbing diagrams in Section V.
Pump operating continually on closed center tractor hydraulic system.	Hydraulic control valve relief stuck open. Hydraulic control valve relief set too low. Valve not correct for closed center operation	See your tractor manual for proper adjustment or Bush Hog dealer for loader valve. (3000 PSI is maximum pressure relief setting recommended) Install closed center plug on optional valve.
Loader lift and bucket tilt controls do not work according to decal.	Hoses improperly connected.	Refer to plumbing diagrams in Section V and correct hose connections.
Valve noisy and/or hot.	Open center control valve on closed center tractor.	Install closed center plug on optional valve.
Tractor loads/pump squeals.	Closed center control valve on open center tractor.	Install open center plug on optional valve.

SECTION V ASSEMBLY



CAUTION

THE FOLLOWING SAFETY PRECAUTIONS SHOULD BE THOROUGHLY UNDERSTOOD BEFORE ATTEMPTING MACHINE ASSEMBLY.

1. Do not lift heavy parts or assemblies. Use crane, jack, tackle, fork trucks, or other mechanical devices.
2. Select an area for assembly that is clean and free of any debris which might cause persons working on the assembly to trip.
3. Arrange parts to be assembled neatly in the work area and have tools or other mechanical assisting devices in easy reach.
4. Inspect all parts and assemblies thoroughly and remove any sharp edges, grease, oil, or dirt which might cause pieces to slip when handling.
5. Preview the assembly instructions in your operator's manual before proceeding further.
6. If the assembly instructions call for parts or assemblies to be blocked up, use only blocking material that is in good condition and is capable of handling the weight of the assembly to be blocked. Also insure that the blocking material is on a clean, dry surface.
7. Never put hands on any other part of body under blocked up assemblies if at all possible.
8. Always wear goggles or safety glasses when hammering, grinding or drilling metal parts.
9. If the assembly calls for welding or cutting, be sure that there are no flammable materials close at hand and that bystanders have taken necessary precautions.

AFTER COMPLETING ANY ASSEMBLY STEP, THOROUGHLY READ THE NEXT STEP IN THE ASSEMBLY INSTRUCTIONS BEFORE PROCEEDING WITH THAT STEP.

10. After completing assembly, thoroughly inspect the machine to be sure that all nuts, bolts, hydraulic fittings or any other fastened assemblies have been thoroughly tightened.

11. After completing assembly, be sure that all safety locking devices or guards are in place.
12. Before operating the machine, thoroughly read the operation section of this manual.
13. Before operating, read the maintenance section of this manual to be sure that any parts requiring lubrication such as gearboxes are full to avoid any possible damage.
14. Wear personal protective equipment such as, but not limited to, protection for eyes, ears, feet, hands, lungs and head when assembling the equipment. Do not wear loose clothing or jewelry that may catch on equipment moving parts.

BEFORE OPERATING THE EQUIPMENT, IF YOU HAVE ANY QUESTIONS REGARDING THE PROPER ASSEMBLY OR OPERATION, CONTACT YOUR AUTHORIZED BUSH HOG DEALER OR REPRESENTATIVE.



CAUTION

EQUIP YOUR TRACTOR WITH A ROPS CAB OR FRAME FOR YOUR PROTECTION. SEE YOUR TRACTOR/ROPS OPERATOR'S MANUAL FOR CORRECT SEAT BELT USAGE.

Read entire instructions before beginning to install the loader. Personal injury and machine damage may be prevented if you read and understand these instructions and special safety messages.

Any reference to right or left are as if you were in the tractor seat facing forward.

5-1 TRACTOR PREPARATION

Use front tires of equal size and maintain equal pressure in each tire. The pressure of the front tractor tires must be increased to the maximum approved pressure recommended by the tire manufacturer to compensate for additional load placed on the tires with the front end loader. Refer to your Tractor Operator's Manual. Adjust the front tires to the widest recommended setting on adjustable models for maximum stability. Front end weights must NOT be used while loader is on the tractor. Pay particular attention to "minimum tread settings" information in Installation Instructions included with your Mounting Kit.

5-2 TRACTOR BALLAST



CAUTION

TO HELP PREVENT ROLLOVER, USE RECOMMENDED REAR TRACTOR BALLAST AND WIDEST WHEEL SETTINGS TO MAXIMIZE STABILITY. SEE YOUR TRACTOR OPERATOR'S MANUAL FOR RECOMMENDATIONS.

Tractor weight bracket may be left in place on certain tractor models with loader mounted. Front tractor weights can only be used when the loader is parked. Weights must be removed before remounting loader or serious damage will occur to loader or tractor front axle due to excessive weight.

The use of adequate rear counterweight to counterbalance for maximum loader capacity is required for safe loader operation. Weight added to the rear of the tractor provides better traction and easier, more efficient loader operation.

IMPORTANT

Do not exceed the maximum load capacity of the tires on your tractor. Refer to the Tire and Wheel Specifications in your Tractor Operator's Manual for more information.

IMPORTANT

This loader has both standard and metric fasteners. Verify that the proper fasteners are placed in the correct locations. Do not tighten any bolts firmly until all components are attached onto the tractor.

5-3 INSTALLATION



WARNING

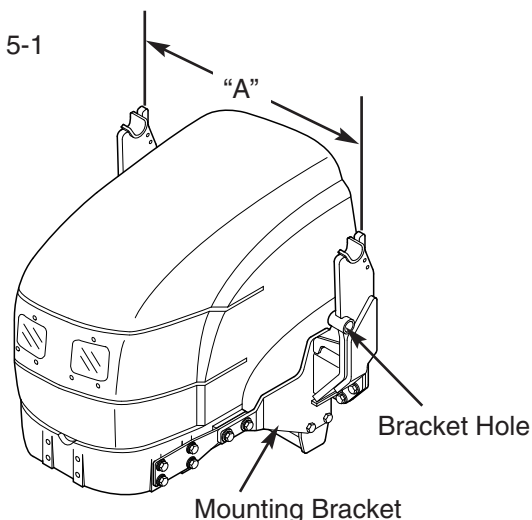
TO AVOID SERIOUS INJURY OR DEATH: READ BEFORE CUTTING BANDS OR REMOVING ATTACHING STRAPS. THE LOADER MAY SHIFT DURING SHIPPING AND HANDLING, MAKING IT UNSTABLE ON THE PALLET. SUPPORT LOADER WITH AN OVERHEAD HOIST OR OTHER SUITABLE MEANS PRIOR TO REMOVING BANDS OR ATTACHING STRAPS SECURING LOADER TO PALLET. FAILURE TO DO SO COULD RESULT IN ACCIDENTAL TIP-OVER OF THE LOADER THAT COULD CAUSE SERIOUS INJURY TO YOU AND/OR BYSTANDERS.

Position the tractor on a hard level surface.

Install mounting brackets on tractor as shown in Installation Instructions included with your Mounting Kit. For ease of handling bracket, insert chain hook into bracket hole. Using hoist, raise and tilt bracket aligning mounting kit holes. Figure 5-1.

Tighten all bolts equally during installation so that outside surface of brackets are level and the center line measurement from right to left hand mounting brackets (Dimension "A") reads 32" plus or minus 1/4" for the 1045, 37" plus or minus 1/4" for the 2045 or 39" plus or minus 1/4" for the 3045. Figure 5-1.

Figure 5-1



IMPORTANT

To prevent mounting kit hardware from loosening during operation, always torque mounting kit hardware to specified torque noted in Loader Operator's Manual.

Remove all loader components from shipping packaging.

5-4 HYDRAULIC HOOKUP

For use with tractor hydraulic valve, install hoses to loader steel tubing. Install male quick couplers (customer furnished) to 1/2" male pipe ends of hoses.

Refer to individual instructions that come with the various other valve and control options.

IMPORTANT

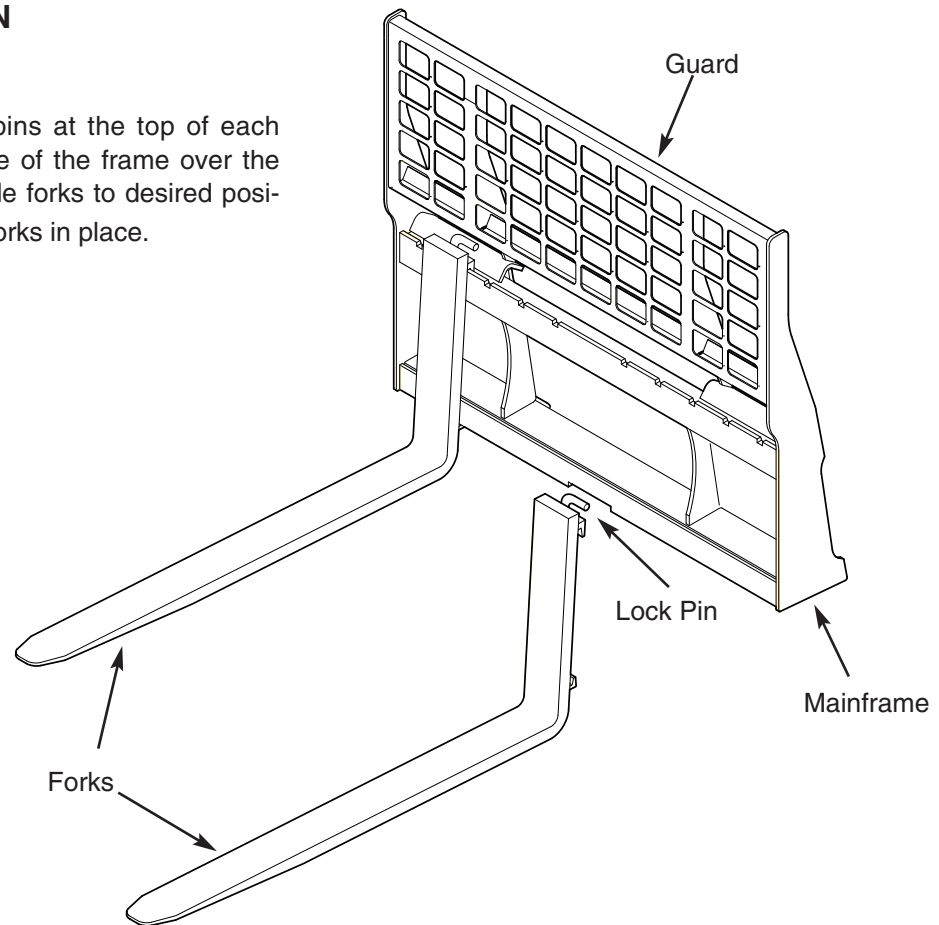
When properly installed, the tractor remote valve or external valve control lever/levers will control the loader hydraulic circuits as described in Sections 3-4 - 3-9. Refer to tractor Operator's Manual for further explanation of tractor remote control lever/levers.

5-5 BUCKET LEVEL INDICATOR ROD

With bucket flat on level surface, fasten "L" end of indicator rod to hole in bucket quick attach with two flat washers and cotter pins as shown in Figure 3-3 on page 15. Install guide bracket over top end of rod as shown. Fasten the bracket to the main frame with 5/16 x 1-1/4" bolt and locknut. Before tightening, ensure that the "kink" in the rod is centered in the bracket slot. This will serve as a visual indication that the bucket is in the level position.

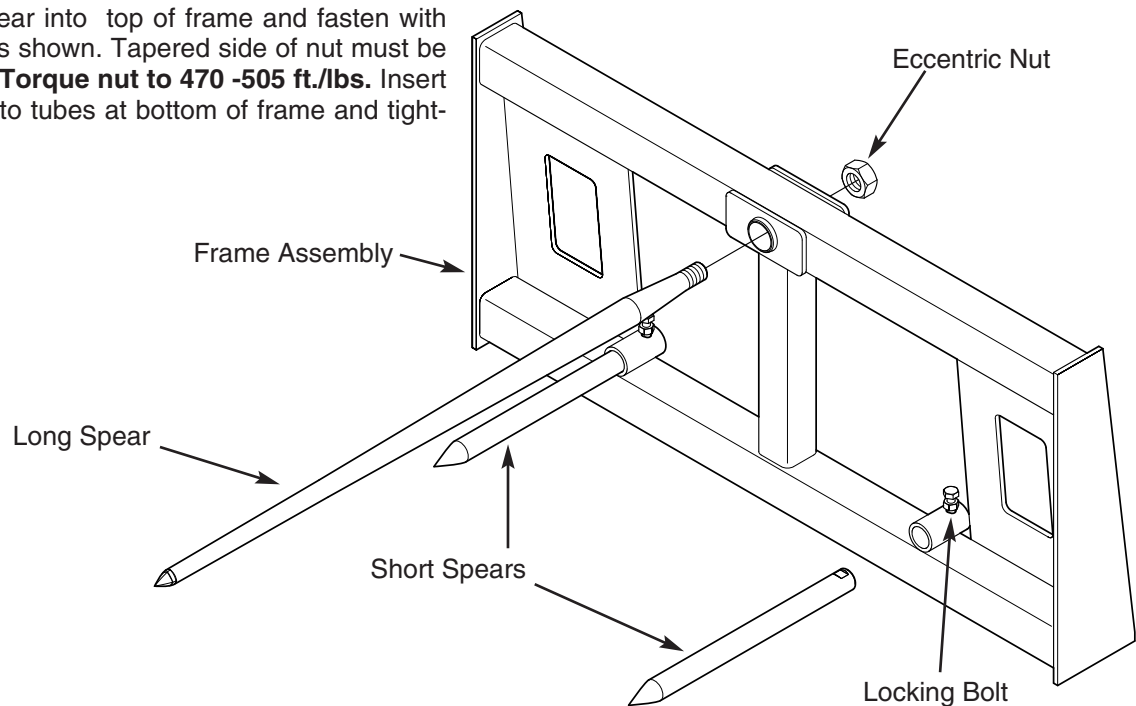
5-6 FORK LIFT OPTION

Raise the positioning lock pins at the top of each fork. Place fork in the middle of the frame over the notch in the lower edge. Slide forks to desired positions and lower pins to lock forks in place.



5-7 BALE SPEAR OPTION

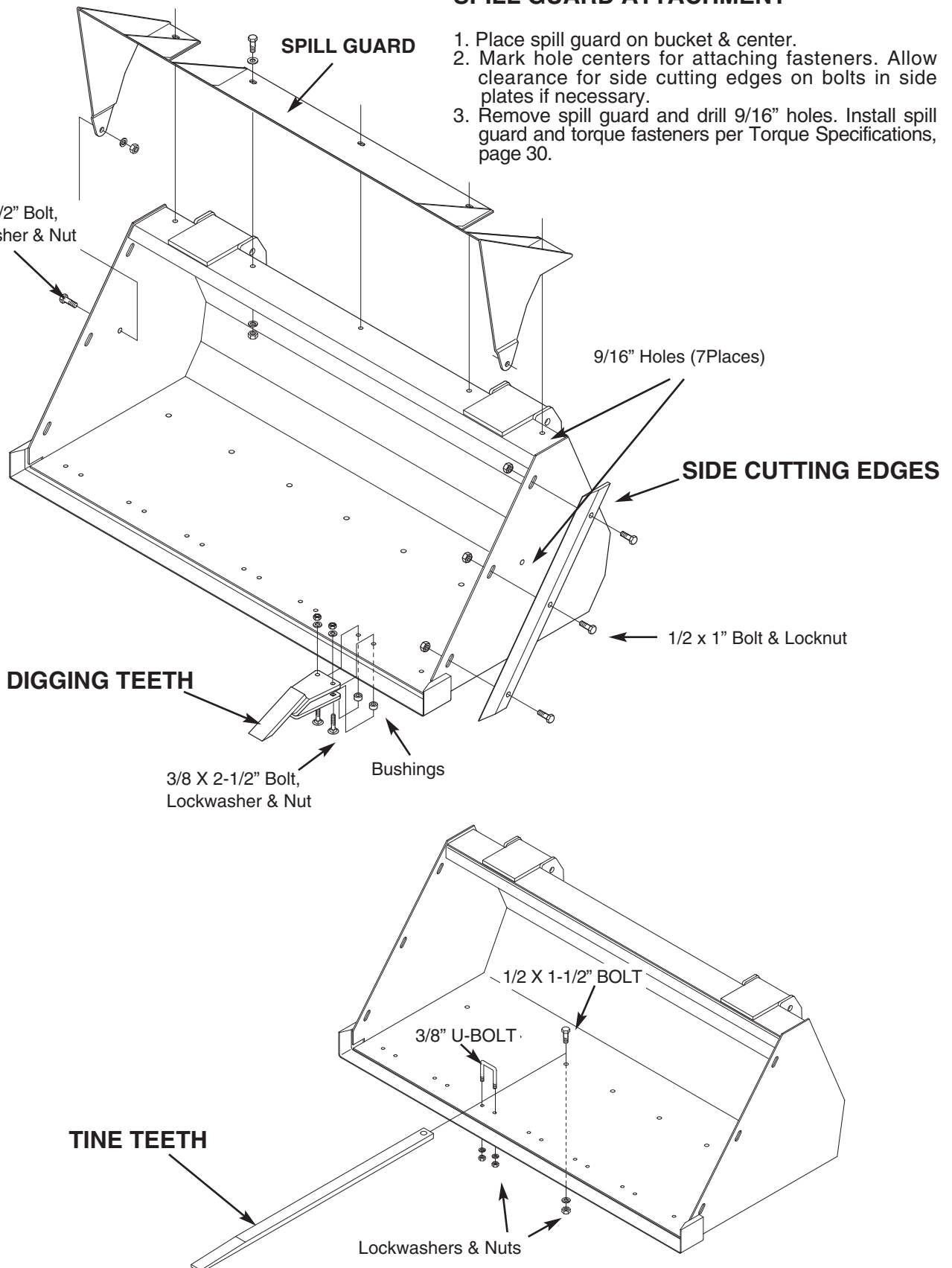
Insert long spear into top of frame and fasten with eccentric nut as shown. Tapered side of nut must be against frame. **Torque nut to 470 -505 ft./lbs.** Insert short spears into tubes at bottom of frame and tighten lock bolts.



5-8 OPTIONAL BUCKET ITEMS ASSEMBLY

SPILL GUARD ATTACHMENT

1. Place spill guard on bucket & center.
2. Mark hole centers for attaching fasteners. Allow clearance for side cutting edges on bolts in side plates if necessary.
3. Remove spill guard and drill 9/16" holes. Install spill guard and torque fasteners per Torque Specifications, page 30.

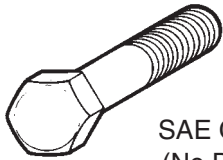


TORQUE SPECIFICATIONS

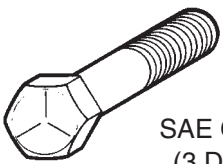
Proper torque for American fasteners used on Bush Hog equipment.
Recommended Torque in Foot Pounds (Newton Meters).*

AMERICAN

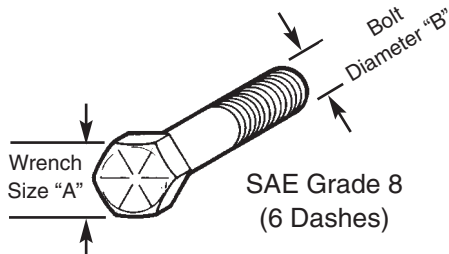
Bolt Head Markings



SAE Grade 2
(No Dashes)



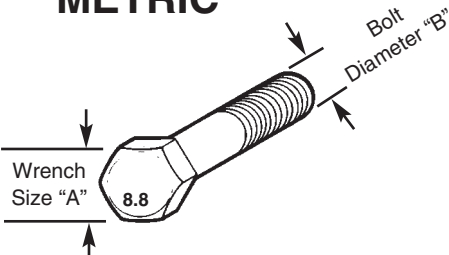
SAE Grade 5
(3 Dashes)



SAE Grade 8
(6 Dashes)

WRENCH SIZE (IN.) "A"	BOLT DIAMETER (IN.) "B" AND THREAD SIZE	SAE GRADE 2	SAE GRADE 5	SAE GRADE 8
7/16	1/4 - 20 UNC	6 (7)	8 (11)	12 (16)
7/16	1/4 - 28 UNF	6 (8)	10 (13)	14 (18)
1/2	5/16 - 18 UNC	11 (15)	17 (23)	25 (33)
1/2	5/16 - 24 UNF	13 (17)	19 (26)	27 (37)
9/16	3/8 - 16 UNC	20 (27)	31 (42)	44 (60)
9/16	3/8 - 24 UNF	23 (31)	35 (47)	49 (66)
5/8	7/16 - 14 UNC	32 (43)	49 (66)	70 (95)
5/8	7/16 - 20 UNF	36 (49)	55 (75)	78 (106)
3/4	1/2 - 13 UNC	49 (66)	76 (103)	106 (144)
3/4	1/2 - 20 UNF	55 (75)	85 (115)	120 (163)
7/8	9/16 - 12 UNC	70 (95)	109 (148)	153 (207)
7/8	9/16 - 18 UNF	79 (107)	122 (165)	172 (233)
15/16	5/8 - 11 UNC	97 (131)	150 (203)	212 (287)
15/16	5/8 - 18 UNF	110 (149)	170 (230)	240 (325)
1-1/8	3/4 - 10 UNC	144 (195)	266 (360)	376 (509)
1-1/8	3/4 - 16 UNF	192 (260)	297 (402)	420 (569)
1-5/16	7/8 - 9 UNC	166 (225)	430 (583)	606 (821)
1-5/16	7/8 - 14 UNF	184 (249)	474 (642)	668 (905)
1-1/2	1 - 8 UNC	250 (339)	644 (873)	909 (1232)
1-1/2	1 - 12 UNF	274 (371)	705 (955)	995 (1348)
1-1/2	1 - 14 UNF	280 (379)	721 (977)	1019 (1381)
1-11/16	1-1/8 - 7 UNC	354 (480)	795 (1077)	1288 (1745)
1-11/16	1-1/8 - 12 UNF	397 (538)	890 (1206)	1444 (1957)
1-7/8	1-1/4 - 7 UNC	500 (678)	1120 (1518)	1817 (2462)
1-7/8	1-1/4 - 12 UNF	553 (749)	1241 (1682)	2013 (2728)
2-1/16	1-3/8 - 6 UNC	655 (887)	1470 (1992)	2382 (3228)
2-1/16	1-3/8 - 12 UNF	746 (1011)	1672 (2266)	2712 (3675)
2-1/4	1-1/2 - 6 UNC	870 (1179)	1950 (2642)	3161 (4283)
2-1/4	1-1/2 - 12 UNF	979 (1327)	2194 (2973)	3557 (4820)

METRIC



Numbers appearing on bolt heads
indicate ASTM class.

Proper torque for metric fasteners used on Bush Hog equipment.
Recommended torque in foot pounds (newton Meters).*

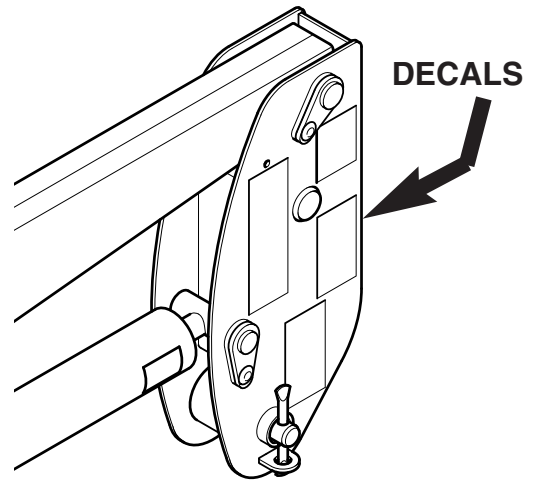
—WRENCH SIZE (mm) "A"	BOLT DIA. (mm) "B"	ASTM 4.6	ASTM 8.8	ASTM 9.8	ASTM 10.9
8	5	1.8 (2.4)		5.1 (6.9)	6.5 (8.8)
10	6	3 (4)		8.7 (12)	11.1 (15)
13	8	7.3 (10)		21.1 (29)	27 (37)
16	10	14.5 (20)		42 (57)	53 (72)
18	12	25 (34)	74 (100)	73 (99)	93 (126)
21	14	40 (54)	118 (160)	116 (157)	148 (201)
24	16	62 (84)	167 (226)	181 (245)	230 (312)
30	20	122 (165)	325 (440)		449 (608)
33	22		443 (600)		611 (828)
36	24	211 (286)	563 (763)		778 (1054)
41	27		821 (1112)		1138 (1542)
46	30	418 (566)	1119 (1516)		1547 (2096)

*Use 75% of the specified torque value for
plated fasteners. Use 85% of the speci-
fied torque values for lubricated fasteners.

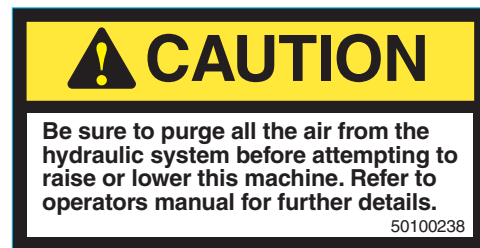
SAFETY DECALS

To promote safe operation, Bush Hog supplies safety decals on all products manufactured. Because damages can occur to safety decals either through shipment, use or reconditioning, Bush Hog will, upon request, provide safety decals for any of our products in the field at no charge. Contact your authorized Bush Hog dealer for more information.

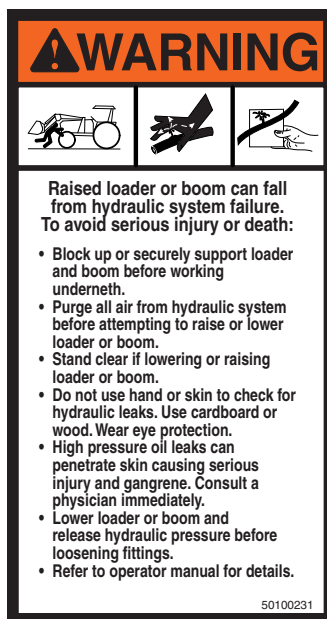
Decals 50100231, 50100232, 50100233 and 50100234 are located on the left side of the subframe. Decal 501002238 is located on the lift cylinder. Other decals are located on attachments (Bucket, Fork Lift, Bale Spear, etc.).



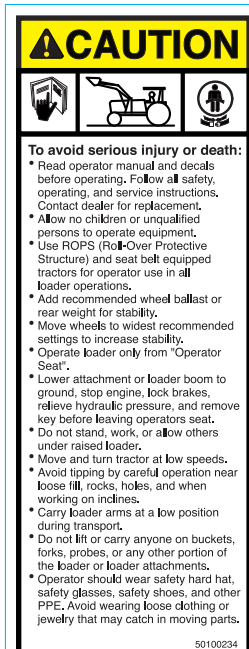
500100233



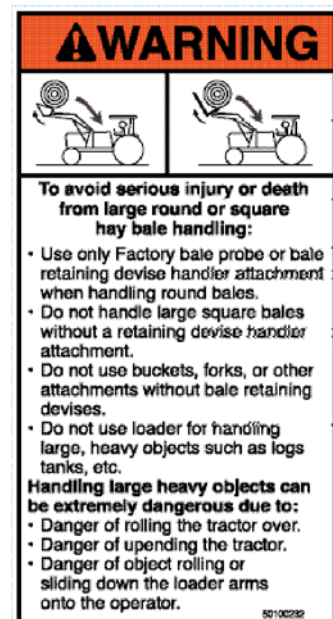
50100238



50100231



50100234



50100232

BUSH HOG L.L.C.

WALVOIL VALVE MOUNTING INSTRUCTIONS

50051735 & 50051736 SINGLE HANDLE VALVE KITS

HYDRAULIC ATTACHMENT

FOR 3545, 4045, 5045, 6045 LOADERS

(See Page 2 for Valve Mounting Instructions)

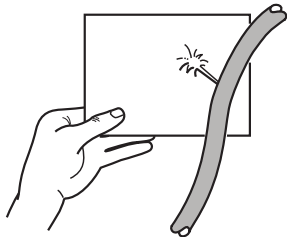


WARNING

THE LOADER CAN FALL FROM HYDRAULIC SYSTEM FAILURE. TO AVOID SERIOUS INJURY OR DEATH, SECURELY SUPPORT LOADER BEFORE WORKING UNDERNEATH.



CAUTION



USE A PIECE OF CARDBOARD OR WOOD RATHER THAN HANDS AND WEAR EYE PROTECTION WHEN SEARCHING FOR HYDRAULIC LEAKS. ESCAPING HYDRAULIC OIL UNDER PRESSURE CAN PENETRATE SKIN. IF OIL IS INJECTED INTO SKIN, IT MUST BE SURGICALLY REMOVED WITHIN A FEW HOURS BY A DOCTOR OR GANGRENE MAY RESULT.

INSTALLATION NOTES

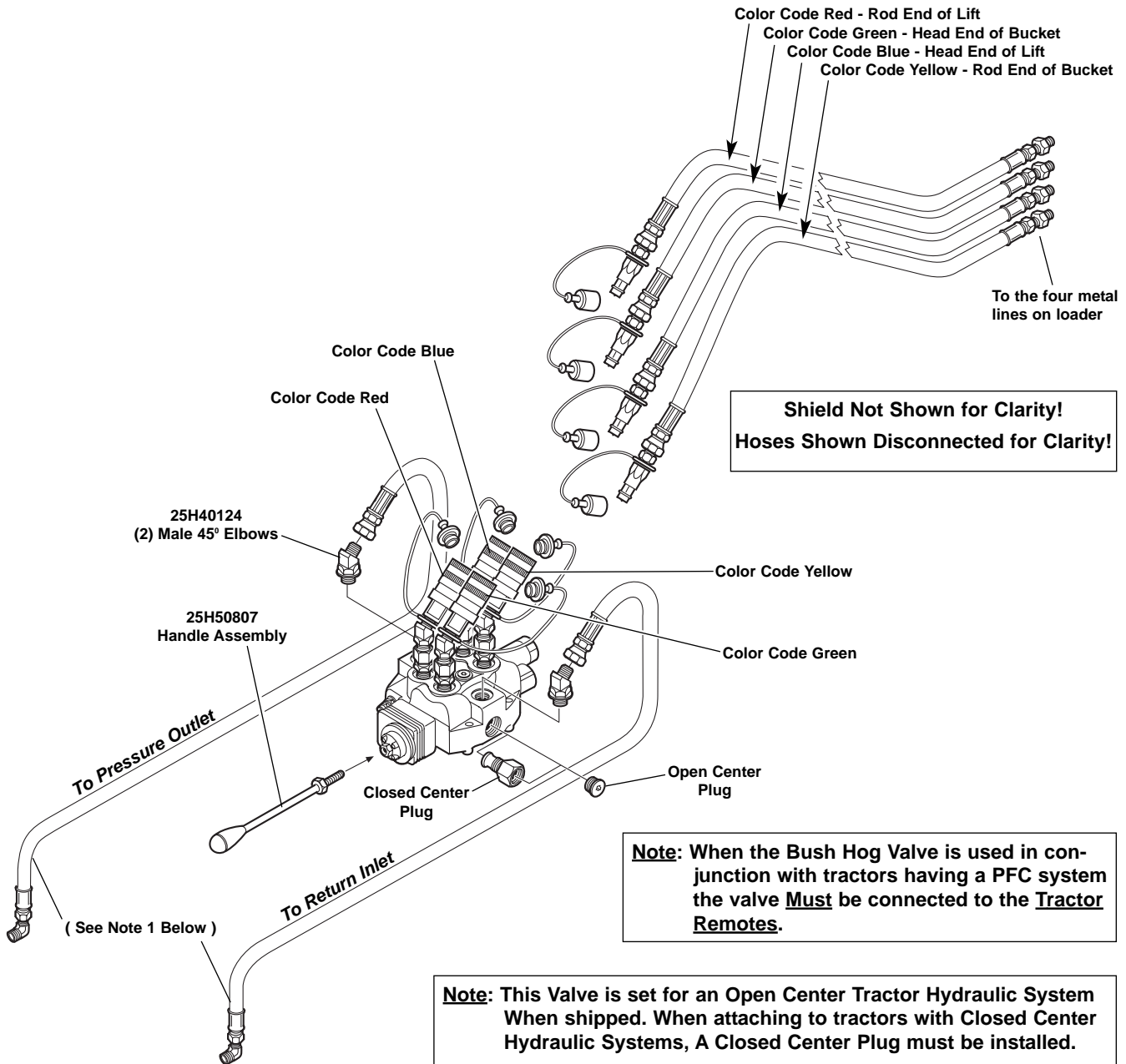
- **CAUTION:** Before leaving tractor seat, stop engine, lock brake, relieve hydraulic pressure, and remove key. **Do Not** allow bystanders in work area.
- When attaching a loader Valve to the rear remotes of the tractor, a power beyond kit is not required. A power beyond kit Must be used when attaching a loader valve to a hydraulic source other than to the rear remotes of a tractor having an Open center hydraulic system.
- A power beyond kit is Not required on tractors with a Closed center hydraulic system. The loader valve may be attached to the tractor at the rear remotes or, at another hydraulic source recommended by the tractor manufacturer.

WALVOIL VALVE MOUNTING INSTRUCTIONS

(See Page 3 for Valve Stand Mounting Instructions)

VALVE PLUMBING ASSEMBLY

Single Handle Controls shown.



Note: When the Bush Hog Valve is used in conjunction with tractors having a PFC system the valve Must be connected to the Tractor Remotes.

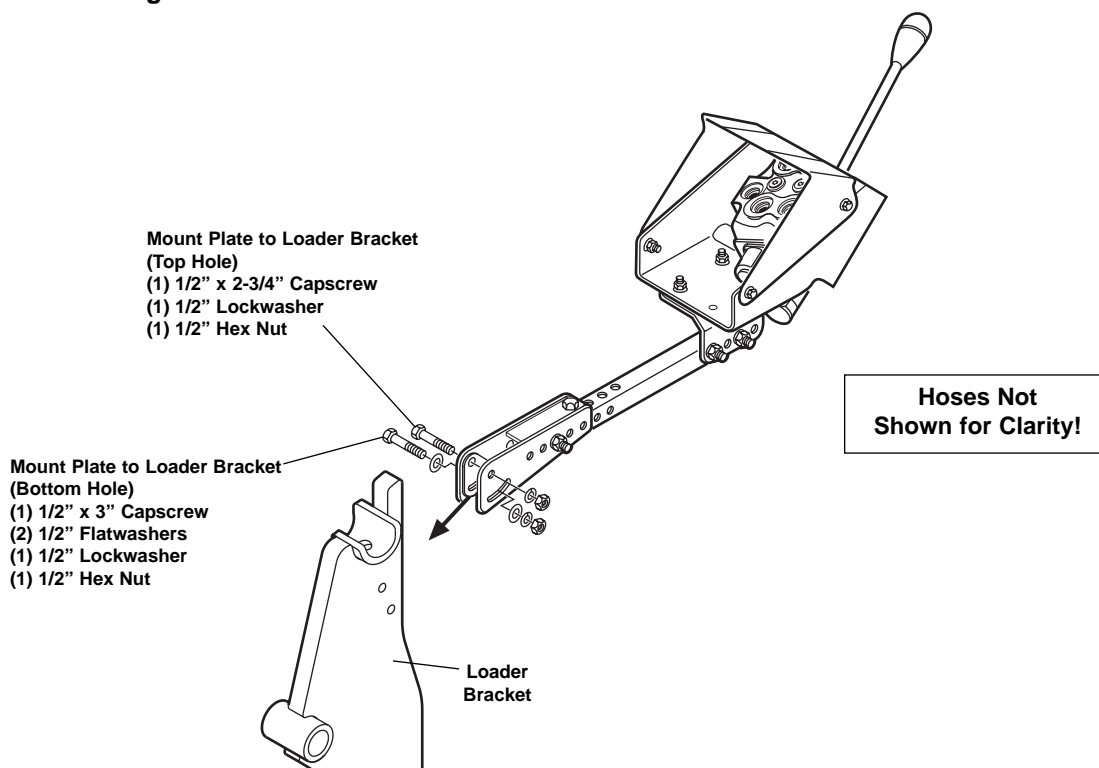
Note: This Valve is set for an Open Center Tractor Hydraulic System When shipped. When attaching to tractors with Closed Center Hydraulic Systems, A Closed Center Plug must be installed.

- (A. Remove Open Center Plug.
- (B. Installed the Closed Plug furnished with valve.
- (C. Reinstall Open Center Plug into end of closed Center Plug.

Note 1: Use two (25H49867) 156" (5045, 6045) Hydraulic Hoses with 50051735 Single Handle.
Use two (25H50266) 120" (3545, 4045) Hydraulic Hoses with 50051736 Single Handle.

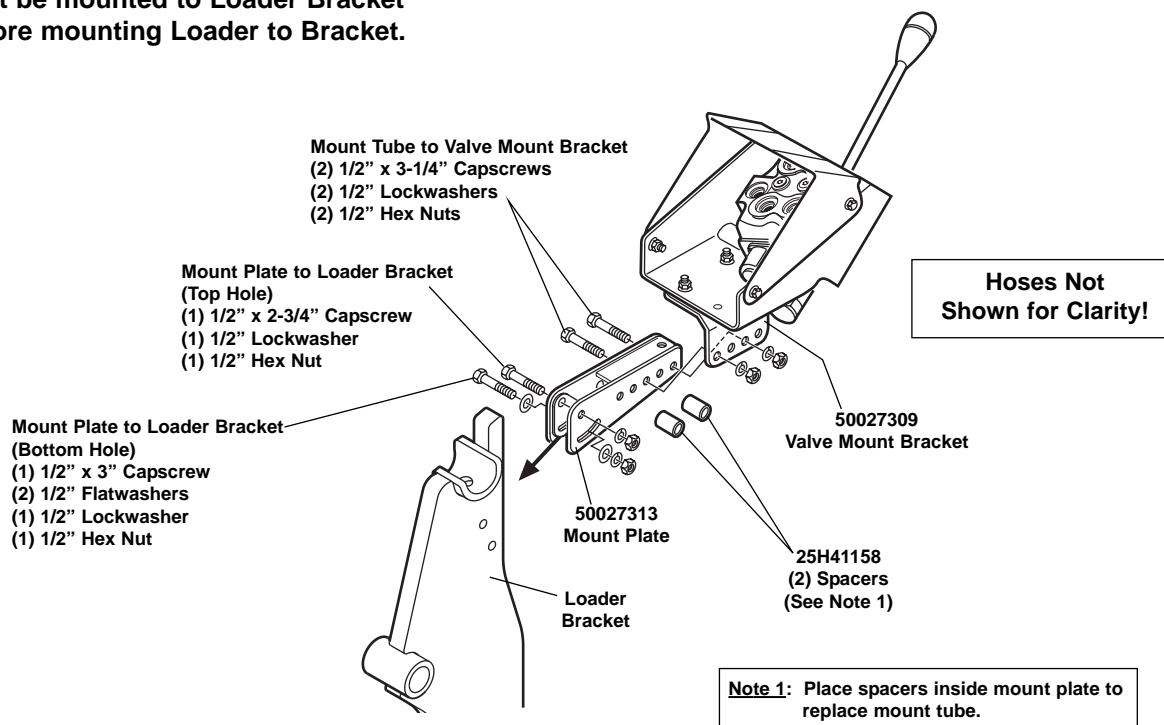
VALVE STAND ASSEMBLY INSTRUCTIONS

Note: Must be mounted to Loader Bracket
before mounting Loader to Bracket.



VALVE SHORT MOUNT ASSEMBLY INSTRUCTIONS

Note: Must be mounted to Loader Bracket
before mounting Loader to Bracket.



50051735 SINGLE HANDLE VALVE KIT		
PART NUMBER	QTY.	PART NAME
50041053.....	1.....	Valve Stand Assembly
50051731.....	1.....	80" Hose Assembly (Blue)
50051734.....	1.....	80" Hose Assembly (Yellow)
50051733.....	1.....	80" Hose Assembly (Red)
50051732.....	1.....	80" Hose Assembly (Green)
50041057.....	2.....	Hydraulic Hose Ass'y (156")
50041055.....	1.....	Single Handle Valve Mnt Ass'y
25H47571.....	5.....	Cable Tie
50051652.....	1.....	Instruction Sheet
50027307.....	1.....	Bag Of Fasteners
25H46807.....	1.....	Corrugated Box

50051736 SINGLE HANDLE VALVE KIT		
PART NUMBER	QTY.	PART NAME
25H46807.....	1.....	Valve Stand Assembly
50051731.....	1.....	80" Hose Assembly (Blue)
50051734.....	1.....	80" Hose Assembly (Yellow)
50051733.....	1.....	80" Hose Assembly (Red)
50051732.....	1.....	80" Hose Assembly (Green)
25H46807.....	2.....	Hydraulic Hose Ass'y (120")
25H46807.....	1.....	Single Handle Valve Mnt Ass'y
25H47571.....	5.....	Cable Tie
50051652.....	1.....	Instruction Sheet
50027307.....	1.....	Bag Of Fasteners
25H46807.....	1.....	Corrugated Box

50027307 BAG OF FASTENERS		
PART NUMBER	QTY.	PART NAME
25H40124.....	2.....	Male 45° Elbow
52161.....	3.....	Cable Tie
51260.....	1.....	Bag
*25H50807.....	1.....	Handle Assemble
*25H50803.....	1.....	Power Beyond Plug
*25H50811.....	1.....	Handle Assembly

*NOTE: These items are part of the Valve Assembly and are removed and placed in the bag for shipping purposes and the handle must be re-assembled to the Valve.



BUSH HOG[®], L.L.C.

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 101 Bush Hog Boulevard • Telford, TN 37690-2421 • (423) 788-7100

BUSH HOG L.L.C.
MOUNTING INSTRUCTIONS
50051729 CABLE CONTROL VALVE KIT
50051730 CABLE CONTROL VALVE KIT
HYDRAULIC ATTACHMENT

FOR MID MOUNT LOADERS

(See Page 2 for Mounting Instructions)

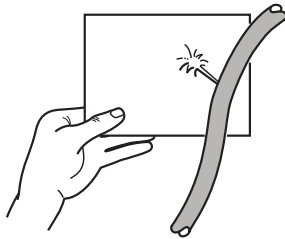


WARNING

THE LOADER CAN FALL FROM HYDRAULIC SYSTEM FAILURE. TO AVOID SERIOUS INJURY OR DEATH, SECURELY SUPPORT LOADER BEFORE WORKING UNDERNEATH.



CAUTION

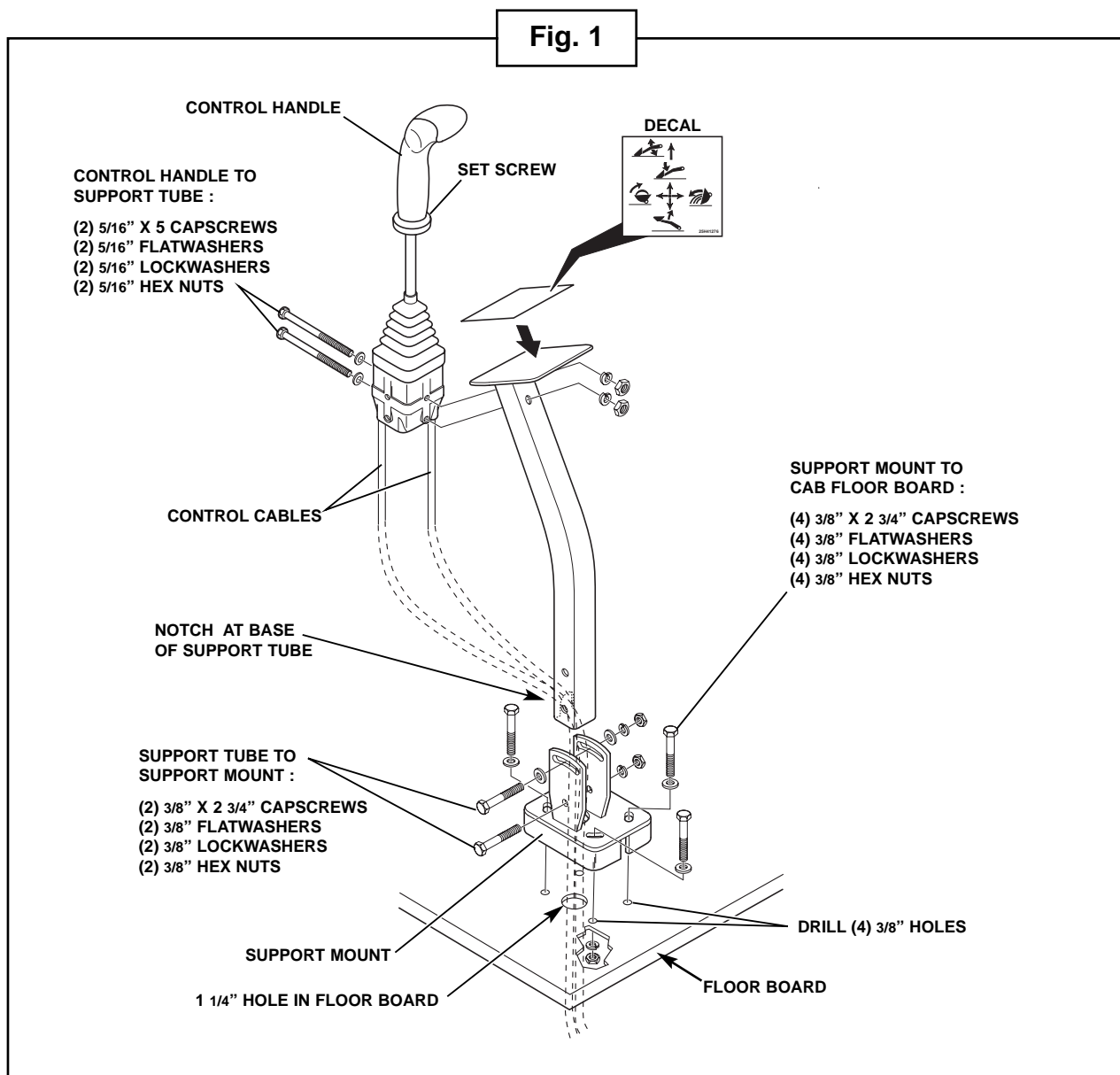


USE A PIECE OF CARDBOARD OR WOOD RATHER THAN HANDS AND WEAR EYE PROTECTION WHEN SEARCHING FOR HYDRAULIC LEAKS. ESCAPING HYDRAULIC OIL UNDER PRESSURE CAN PENETRATE SKIN. IF OIL IS INJECTED INTO SKIN, IT MUST BE SURGICALLY REMOVED WITHIN A FEW HOURS BY A DOCTOR OR GANGRENE MAY RESULT.

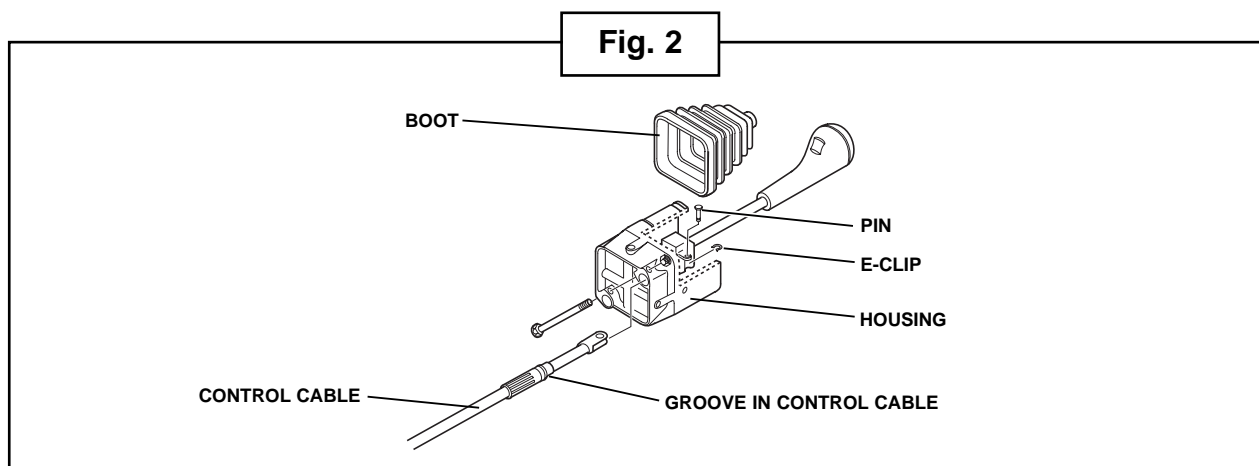
**ATTACHING HANDLE MOUNT, CONTROL HANDLE
AND CABLES TO TRACTOR**

1. **CAUTION:** Before leaving tractor seat, stop engine, lock brake, relieve hydraulic pressure, and remove key. **Do Not** allow bystanders in work area.
2. Locate an area in the front-right side of tractor floor board to mount the support mount. (**NOTE:** If the floor board has a floor matt, role the matt back in the area chosen to check for pre-drilled mounting holes by the tractor manufacturer). If mounting holes will have to be drilled, make sure the area on the underside of the floor board has no cables, tubes, linkages or any other obstructions that would interfere or be damaged by drilling to mount the support weldment.

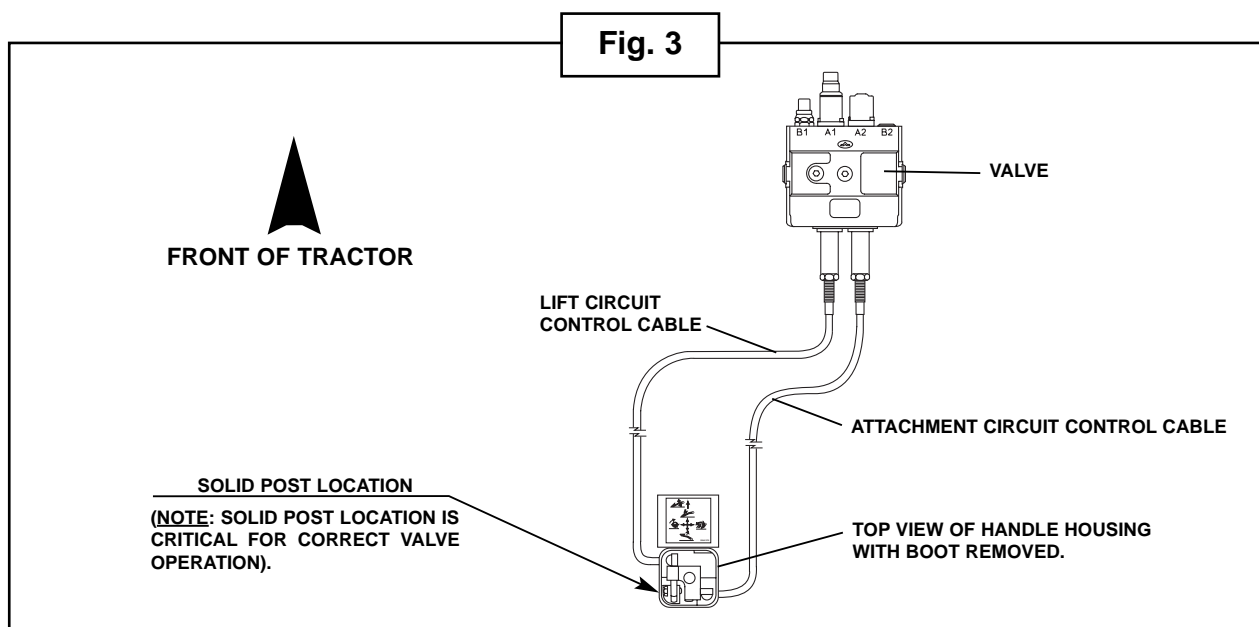
3. Assemble the mount to the support tube and handle to the support tube (refer to Fig. 1). Leave all fasteners snug but not tight. position the assembly on the area of the floor board chosen and adjust the assembly to be sure the operator has complete and comfortable access to the control handle. (**NOTE: The support mount may be rotated 180° from position shown in Fig. 1 if necessary for better access to the controls**). If the tractor has a floor matt, use the support mount as a template and mark the area around the base of the support mount where it contacts the matt. Cut the matt on the marked area and remove the cut out piece of matt.
4. It will be necessary to remove the support mount from the support tube to perform this step. Position support mount on the cab floor board and use the mount as a template. Drill four 3/8" holes in line with the four slotted holes in the support mount. Mark the center of the 1 1/4" hole in the support mount on the floor board as close as possible to the hole in the support mount. Use a hole saw and cut a 1 1/4" hole that aligns with the large hole in the support mount (Refer to Fig. 1).



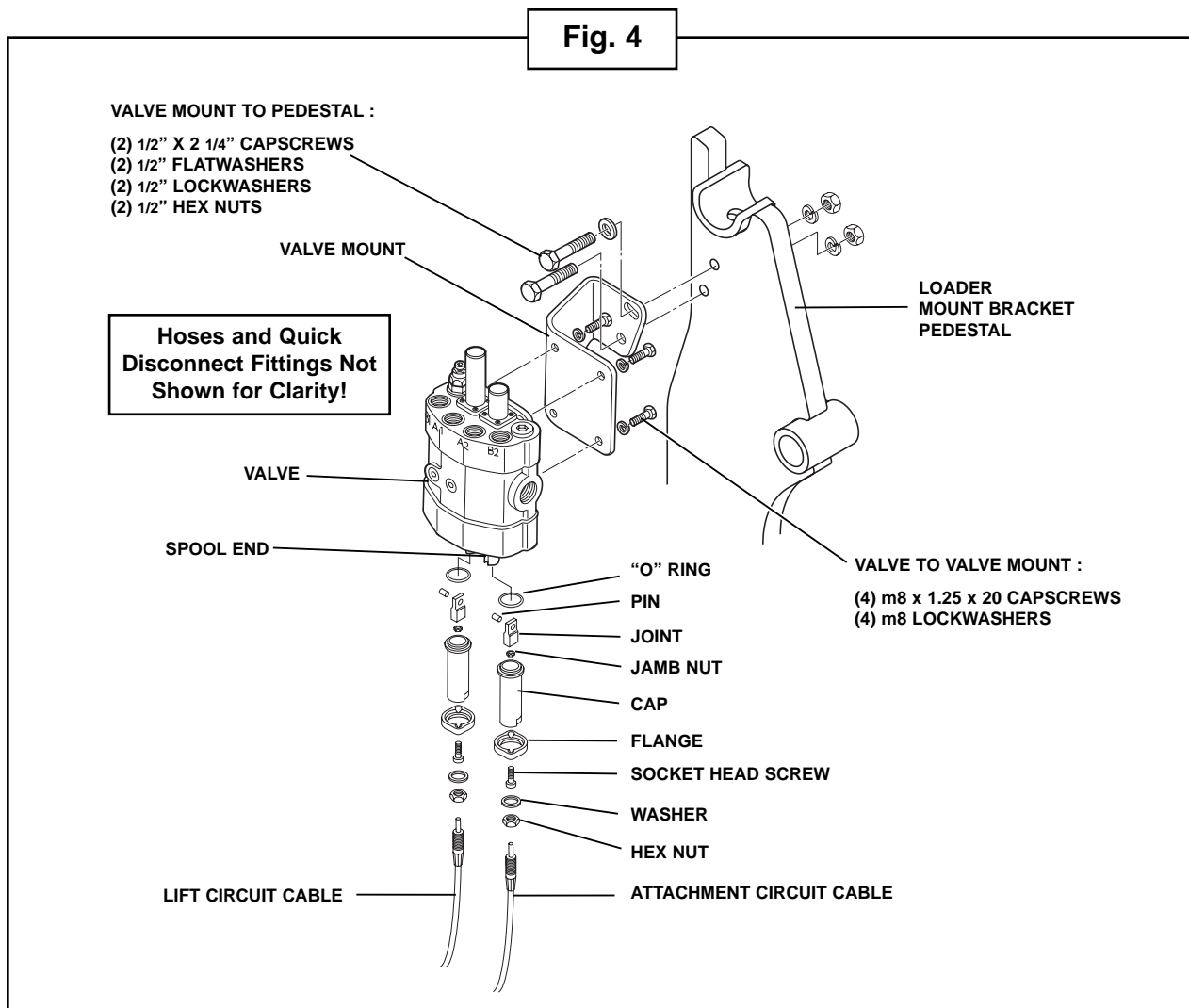
5. Attach the support mount to the floor board with (4) 3/8" x 2 3/4" Gr. 5 capscrews, 3/8" flat-washers, 3/8" lockwashers and 3/8" hex nuts provide in kit (Refer to Fig. 1).
6. Attach the control cables to the control handle body (Refer to Fig. 2). Remove the rubber boot from the control handle body. Insert the end of the cable into the control handle body enough to align the clevis on the end of the cable tab on the handle. Insert the pin through the clevis and tab and secure in place with the E-clip. Position the cable body so the groove in the cable body aligns with the cross drilled hole in the handle body. Insert metric bolt in cross drilled hole and through groove in cable body and secure with the metric nut.



7. Attach the handle body to the support tube as shown in Fig. 1. Make sure the solid post in the control handle is positioned as shown in Fig. 3. (**NOTE: The solid post position is critical for the correct operation of this valve**). Install the rubber boot. The knob on the control handle must be rotated 180° for this application. Loosen the setscrew in the base offline knob, rotate 180° and retighten the set screw.



8. Rotate the valve ends of the cables through the notch at the bottom of the support tube and through the large hole in the support mount and floor board of the tractor. Attach the support tube to the support mount as shown in Fig. 1. (**NOTE: Take care to not cut cable covering on sharp edges and be sure cable routing will not cause binding when attached to the valve**).
9. Tighten all fasteners for handle controls and apply control decal to plate atop the support tube (Refer to Fig. 1).
10. **ATTACHING VALVE TO LOADER FRAME:**
Attach the valve mount to the outside surface of the pedestal on the mounting bracket of load on right hand side of the tractor. Use the 1/2" x 2 1/4" capscrews, 1/2" flatwashers, 1/2" lockwashers and 1/2" hex nuts as shown in Fig. 4.
11. Attach valve to valve mount using the (4) m8 x 1.25 x 20 Gr. 8.8 capscrews and m8 lockwashers as shown in Fig. 4. Be sure that the work ports are on top and the attaching ends of the spools are down.
12. It will be necessary to install the cable attaching kit on the cable in the order shown in Fig. 4. The nut, washer, flange and cap must be ran across the threaded part of the cable until they are hanging loose on the cable.



13. Install joint to the cable end and snug up the jamb nut. Connect the cable to the control valve spools (Refer to Fig. 3 for correct location of cables to spools).
14. Place joint in slot on end of spool and place pin in hole. Place "O" ring in inset of valve around spool and run cap up on threads of cable end. Pull flange up around the cap and attach to the valve using the (2) m5 x 20 socket head screws provided. Pull washer up to base of cap and run the nut to contact the washer.
15. **CONNECTING HYDRAULICS (Refer to Fig. 5 and Fig. 6):**
Attach (4) 68" hose assemblies by plugging into the matching color on the female halves mounted on the valve (Refer to Fig. 5).
16. Attach the (4) hoses from the valve to the metal lines on the boom frame on the right hand side of loader. Use the (4) 3/4" JIC x 3/4" JIC male unions provided.

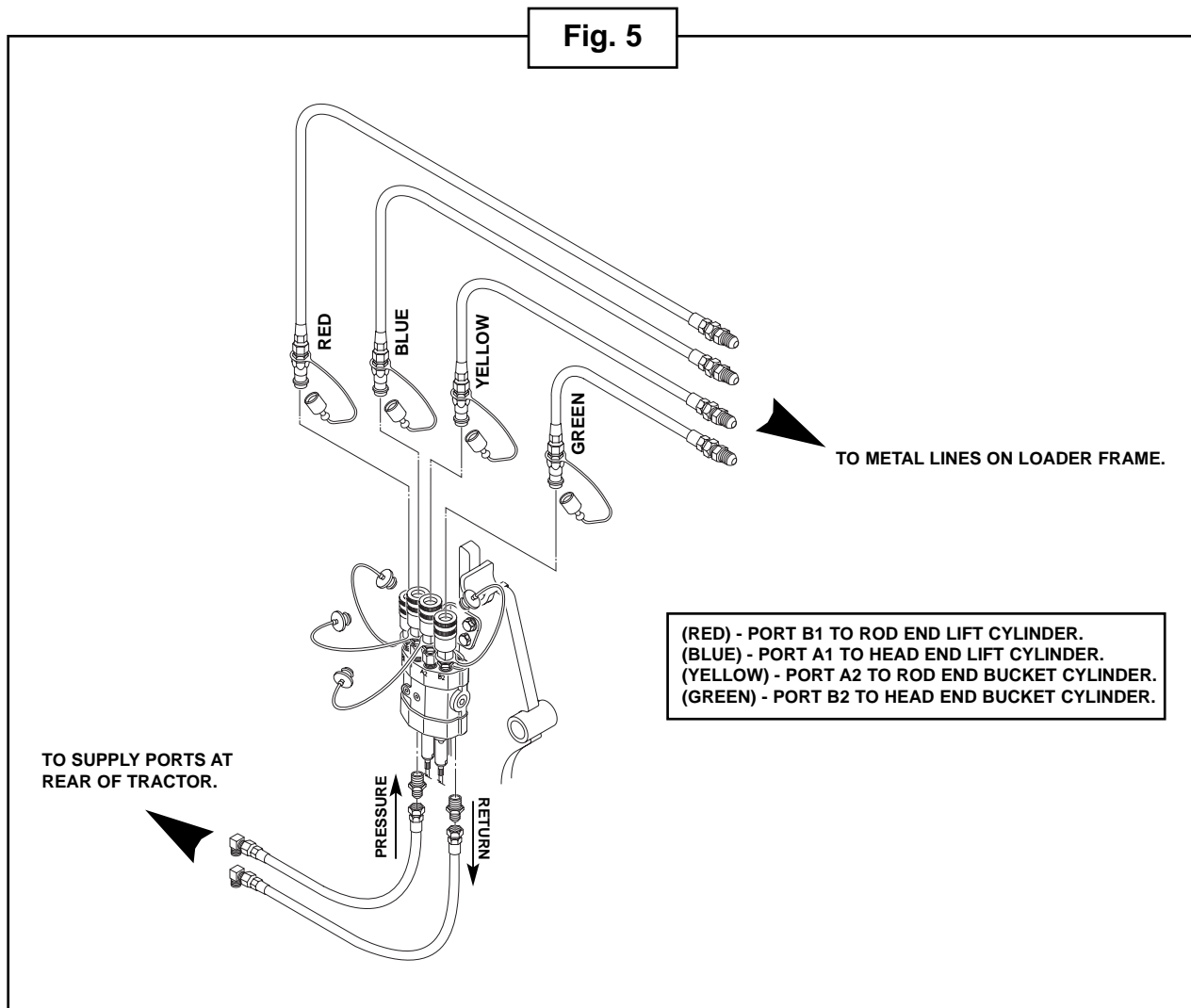
Attach as follows: (Refer to Fig. 5).

Port A1 (Blue) to head end of lift cylinder.

Port B1 (Red) to rod end of lift cylinder.

Port A2 (Yellow) to rod end of bucket cylinder.

Port B2 (Green) to head end of bucket cylinder.



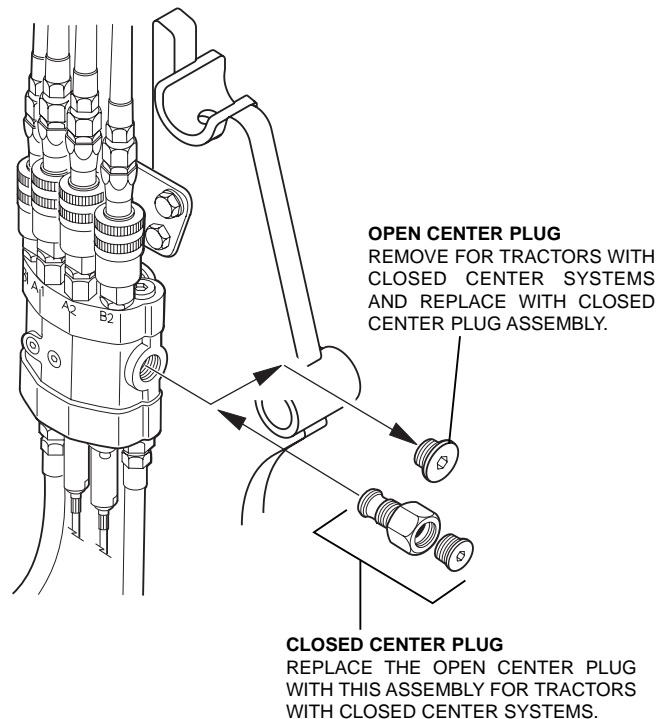
17. **NOTE:** This valve is set for a open center tractor hydraulic system. If tractor has a closed center system a closed center plug must be installed. Remove the open center plug in valve. Install the closed center plug furnished with the valve (Refer to Fig. 6).
18. Tighten all fittings and connections and install proper fitting to the supply and return lines at the rear of the tractor and connect to the tractor.
19. **Adjust the cables so the control handle operates as follows:**
- When properly adjusted, control handle will spring back to neutral position whenever valve spool is moved into the working position.
 - When properly adjusted, control handle will be able to pushed forward, positioning the valve spool into the float detent position. Handle must be manually pulled rearward to disengage float position.
20. **When valve circuit is properly connected, control handle should operate loader as follows:**
- Pull handle back to raise loader.
 - Push handle forward to lower loader.
 - Push handle full forward to activate float detent position.
 - Move handle to the right to dump attachment.
 - Move handle to the left to roll back the attachment.

NOTE: Contaminant's in hydraulic oil can cause valve spools to stick. **BE ALERT** when operating loader and follow your tractors operators manual oil maintenance schedule.

Fig. 6

NOTES:

1. WHEN ATTACHING A LOADER VALVE TO THE REAR REMOTES OF THE TRACTOR, A POWER BEYOND IS NOT REQUIRED. A POWER BEYOND KIT **MUST** BE USED WHEN ATTACHING A LOADER VALVE TO A HYDRAULIC SOURCE OTHER THAN THE REAR REMOTES OF A TRACTOR HAVING AN **OPEN** CENTER HYDRAULIC SYSTEM.
2. A POWER BEYOND KIT IS **NOT** REQUIRED ON TRACTORS WITH A **CLOSED** CENTER HYDRAULIC SYSTEM. THE LOADER VALVE MAY BE ATTACHED TO THE TRACTOR AT THE REAR REMOTES OR, AT ANOTHER HYDRAULIC SOURCE RECOMMENDED BY THE TRACTOR MANUFACTURER.
3. IF POWER BEYOND SYSTEM IS USED, REFER TO BASIC POWER BEYOND PLUMBING INSTRUCTIONS FURNISHED WITH POWER BEYOND KIT.
4. IF THE TRACTOR HAS A PRESSURE FLOW COMPENSATED SYSTEM (PFC) - THE LOADER VALVE **MUST** BE CONNECTED TO THE **TRACTOR REMOTES**.



50051730 CABLE CONTROL VALVE KIT		
PART NUMBER	QTY.	PART NAME
50051669.....	1.....	68" Hose Assembly (Green)
50051670.....	1.....	68" Hose Assembly (Red)
50051671.....	1.....	68" Hose Assembly (Yellow)
50051672.....	1.....	68" Hose Assembly (Blue)
50041056.....	2.....	Hydraulic Hose (120")
50041068.....	1.....	Cable Control Valve Ass'y
50020851.....	1.....	Control Handle
50020540.....	2.....	Control Cable (78")
50026999.....	2.....	Cable Connector Kit
50027394.....	1.....	Support Weldment
50027391.....	1.....	Support Tube Weldment
50027388.....	1.....	Valve Mount
50051651.....	1.....	Instruction Sheet
50027390.....	1.....	Bag Of Hardware
68822.....	1.....	Crate

50051729 CABLE CONTROL VALVE KIT		
PART NUMBER	QTY.	PART NAME
50051669.....	1.....	68" Hose Assembly (Green)
50051670.....	1.....	68" Hose Assembly (Red)
50051671.....	1.....	68" Hose Assembly (Yellow)
50051672.....	1.....	68" Hose Assembly (Blue)
50041057.....	2.....	Hydraulic Hose (156")
50041068.....	1.....	Cable Control Valve Ass'y
50020851.....	1.....	Control Handle
50020540.....	2.....	Control Cable (78")
50026999.....	2.....	Cable Connector Kit
50027394.....	1.....	Support Weldment
50027391.....	1.....	Support Tube Weldment
50027388.....	1.....	Valve Mount
50051651.....	1.....	Instruction Sheet
50027390.....	1.....	Bag Of Hardware
68822.....	1.....	Crate

50027390 BAG OF HARDWARE		
PART NUMBER	QTY.	PART NAME
25H47571.....	5.....	Cable Tie
08151600.....	2.....	Hexnut 1/2" ZP
15528.....	2.....	Hexnut 5/16" ZP
08151200.....	6.....	Hexnut 3/8" ZP
15806.....	2.....	Lockwasher 1/2" ZP
15812.....	6.....	Lockwasher 3/8" ZP
15808.....	6.....	Lockwasher 5/16" ZP
44311.....	4.....	Lockwasher M8 ZP
15915.....	6.....	Flatwasher 3/8" ZP
15916.....	1.....	Flatwasher 1/2" ZP
15907.....	2.....	Flatwasher 5/16" ZP
44098.....	6.....	HHCS 3/8" x 2 3/4" G5 ZP
44582.....	2.....	HHCS 5/16" x 5" G5 ZP
44315.....	4.....	HHCS M8 x1.25"x20" G8.8 ZP
15080.....	2.....	HHCS 1/2" x 2 1/4" G5 ZP
25H43832.....	2.....	Straight Thread Adaptor
25H41276.....	1.....	Valve Control Decal
51260.....	1.....	Bag

INSTALLATION INSTRUCTIONS FOR 24H46343 POWER BEYOND KIT

The **POWER BEYOND KIT** is only required if connecting to an open center tractor hydraulic system. The use of a power beyond kit allows the connection of the Bush Hog optional control valve to the tractor hydraulics without using the remote controlled outlets on the tractor. It's purpose is to protect the normal return port of the Bush Hog valve from back pressure. Connection to the tractor remote provides this protection through the tractor remote control valve.

Bush Hog now provides two styles of Walvoil optional control valves: one for standard mounts and one for cable control. The illustrations show both valves and the hose routing for both. The fittings required to connect the hoses to both valves are provided in the kit. The power beyond plug for each valve is included in the valve kit ordered separately.

Three lines must be connected to the tractor system. Each line serves a specific purpose and proper plumbing is essential. The proper location for the connections to the tractor hydraulic system must be obtained from the tractor manufacturer or local tractor dealership.

LINE A - PRESSURIZED SUPPLY LINE — Supplies oil from the pump to the pressure port of the control valve. This line is the pressurized supply line to the valve when the handle on the optional control valve is activated to move the boom or bucket cylinder.

LINE B - PRESSURIZED RETURN LINE TO TRACTOR SYSTEM — Returns oil to the tractor system when the optional control valve is in the neutral position. This line will feel any back pressure generated by operation of any other tractor system hydraulic function.

LINE C - NON PRESSURIZED RETURN LINE — Returns oil to the tractor system when the optional control valve is activated to extend or retract the boom or bucket cylinders. This line must be connected to the tractor system to provide a **DIRECT** return of the oil to the tractor sump or oil supply tank.

HOSE AND COUPLER ASSEMBLY

The three hydraulic hoses are supplied with reusable couplings for one end while the other end has permanently installed couplings. The hose length must be determined for your tractor model.

BE SURE TO MAKE HOSES LONG ENOUGH to attach to tractor when loader is disconnected from tractor and is on its leg stands.

1. Attach permanent coupler ends of hose to fittings, installed in the pressure, sump and power beyond ports of the valve. The long hose should be attached to the sump port. See back page for instructions on installing reusable coupling.
2. Determine required length of each hose, attach reusable couplings to hoses per instructions shown.
3. Install the three adaptors furnished into the hoses on the reusable coupling end. Place the 3/4" JIC end of the adaptor to hose.
4. Attach two quick coupler female ends to adaptors on the pressure hose and the sump hose. Install a quick coupler male end, to return pressurized return inlet hose (power beyond hose).
5. Attach two quick coupler male ends to pressure hose and sump hose from tractor. Attach one quick coupler female end to tractor return outlet.

DISCONNECTING LOADER VALVE FROM TRACTOR

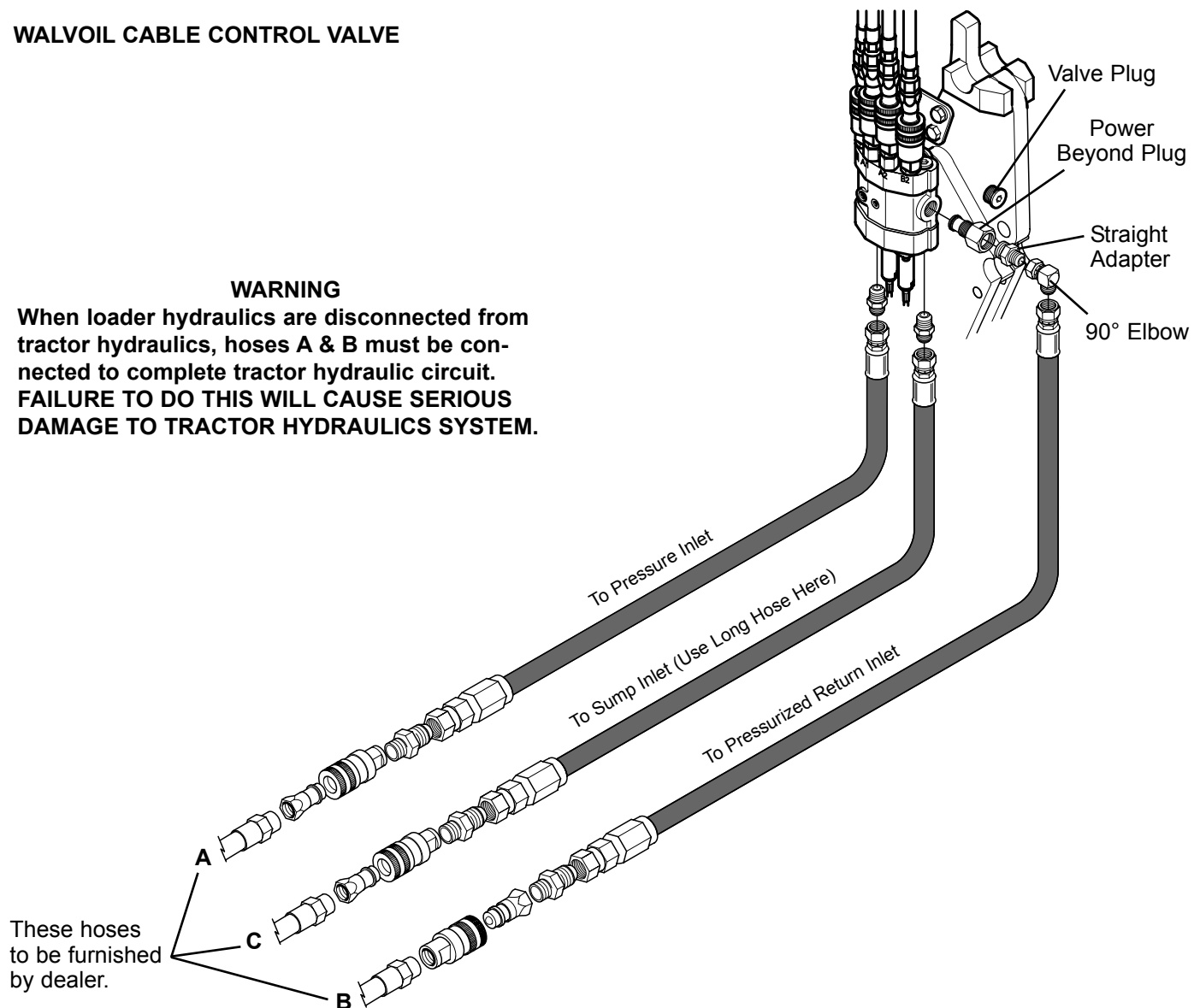
The pressurized supply line, A, and the pressurized return line (power beyond port) must be connected when the loader valve is removed from the tractor. Insure female and male quick couplers are installed per paragraph 4 above. Failure to make this connection will result in damage to the tractor hydraulic system.



WALVOIL CABLE CONTROL VALVE

WARNING

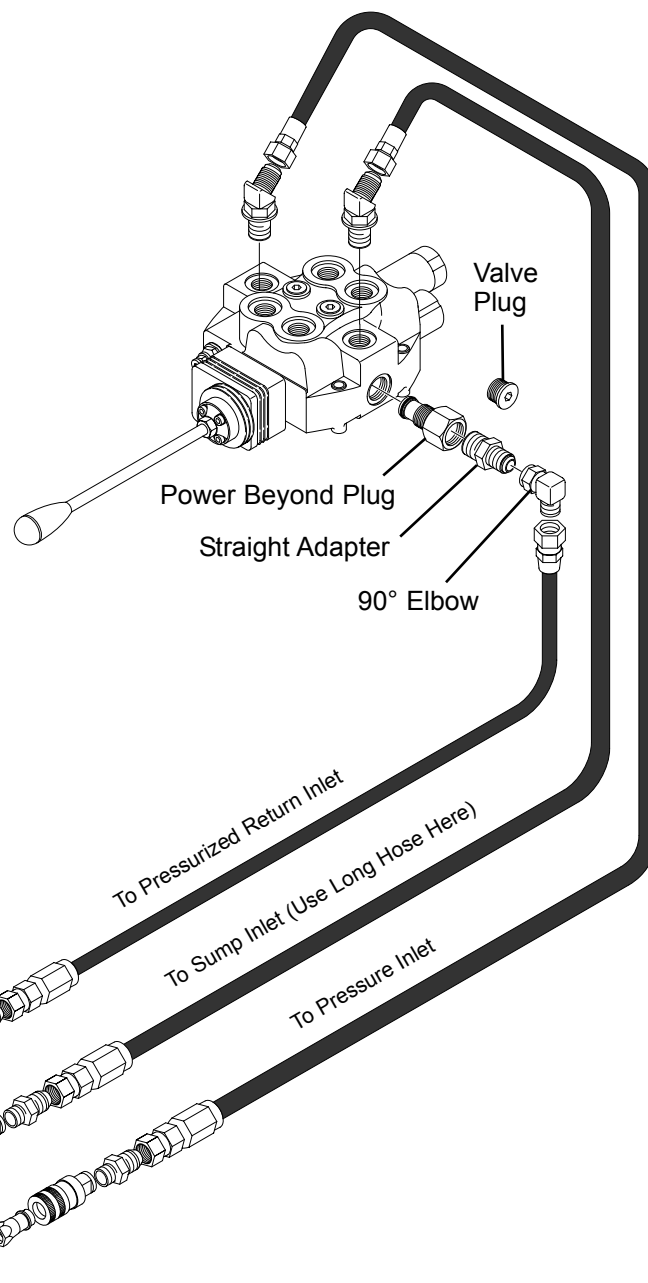
When loader hydraulics are disconnected from tractor hydraulics, hoses A & B must be connected to complete tractor hydraulic circuit. FAILURE TO DO THIS WILL CAUSE SERIOUS DAMAGE TO TRACTOR HYDRAULICS SYSTEM.



CABLE CONTROL WALVOIL VALVE ASSEMBLY

1. Remove valve plug from right side of valve.
2. Install power beyond plug in same hole, valve plug removed. (Note: Power beyond plug is shipped with valve.) Torque from 20 to 25 ft./lbs.
3. Install straight adaptor 3/4" JIC to 7/8" SAE in power beyond port.
4. Before further hydraulic assembly is done, install valve to valve mounting hardware as instructed in the hose and valve kit package. The straight adaptor should extend through the hole in the right side of the valve mount.
5. Install 90° elbow 3/4" JIC male to 3/4" JIC female on straight adaptor installed in power beyond plug.

STANDARD WALVOIL VALVE



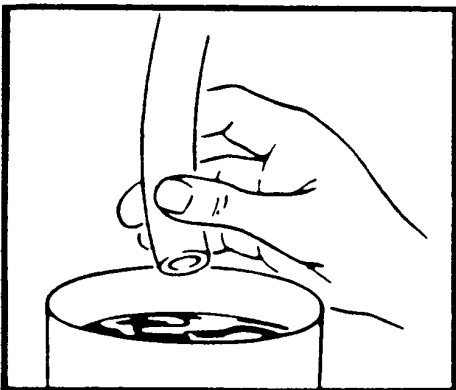
WARNING

When loader hydraulics are disconnected from tractor hydraulics, hoses A & B must be connected to complete tractor hydraulic circuit. FAILURE TO DO THIS WILL CAUSE SERIOUS DAMAGE TO TRACTOR HYDRAULICS SYSTEM.

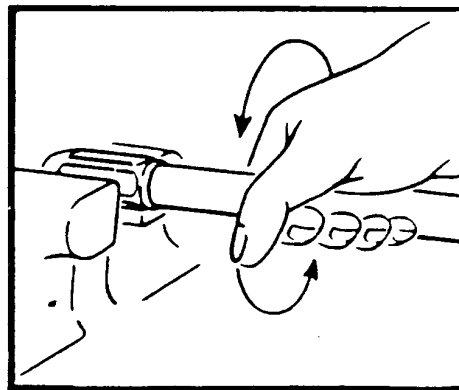
STANDARD WALVOIL VALVE ASSEMBLY

1. Remove valve plug from right side of valve.
2. Install power beyond plug in same hole, valve plug removed. (Note: Power beyond plug is shipped with valve.) Torque from 20 to 25 ft./lbs.
3. Install straight adaptor 3/4" JIC to 7/8" SAE in power beyond port.
4. Before further hydraulic assembly is done, install valve to valve mounting hardware as instructed in the hose and valve kit package. The straight adaptor should extend through the hole in the right side of the valve mount.
5. Install 90° elbow 3/4" JIC male to 3/4" JIC female on straight adaptor installed in power beyond plug.

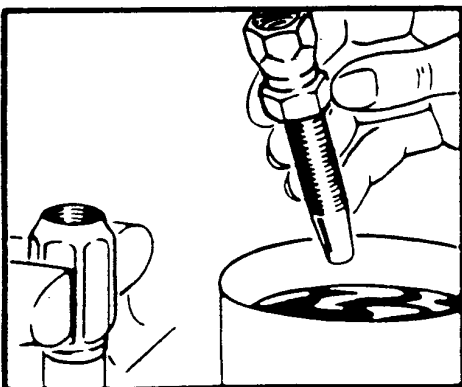
Assembly in Five Easy Steps For Reusable Fitting



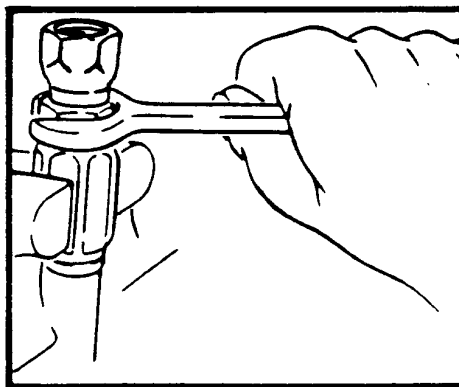
1. Be sure to thoroughly oil hose.



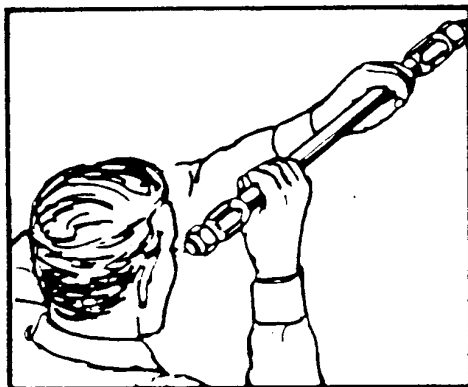
2. Put socket in vise as shown. Turning counter-clockwise, thread hose into socket. Leave a gap of $\frac{1}{32}$ " to $\frac{1}{16}$ " between end of hose and inside shoulder of socket.



3. Oil insert thread on nipple thoroughly.



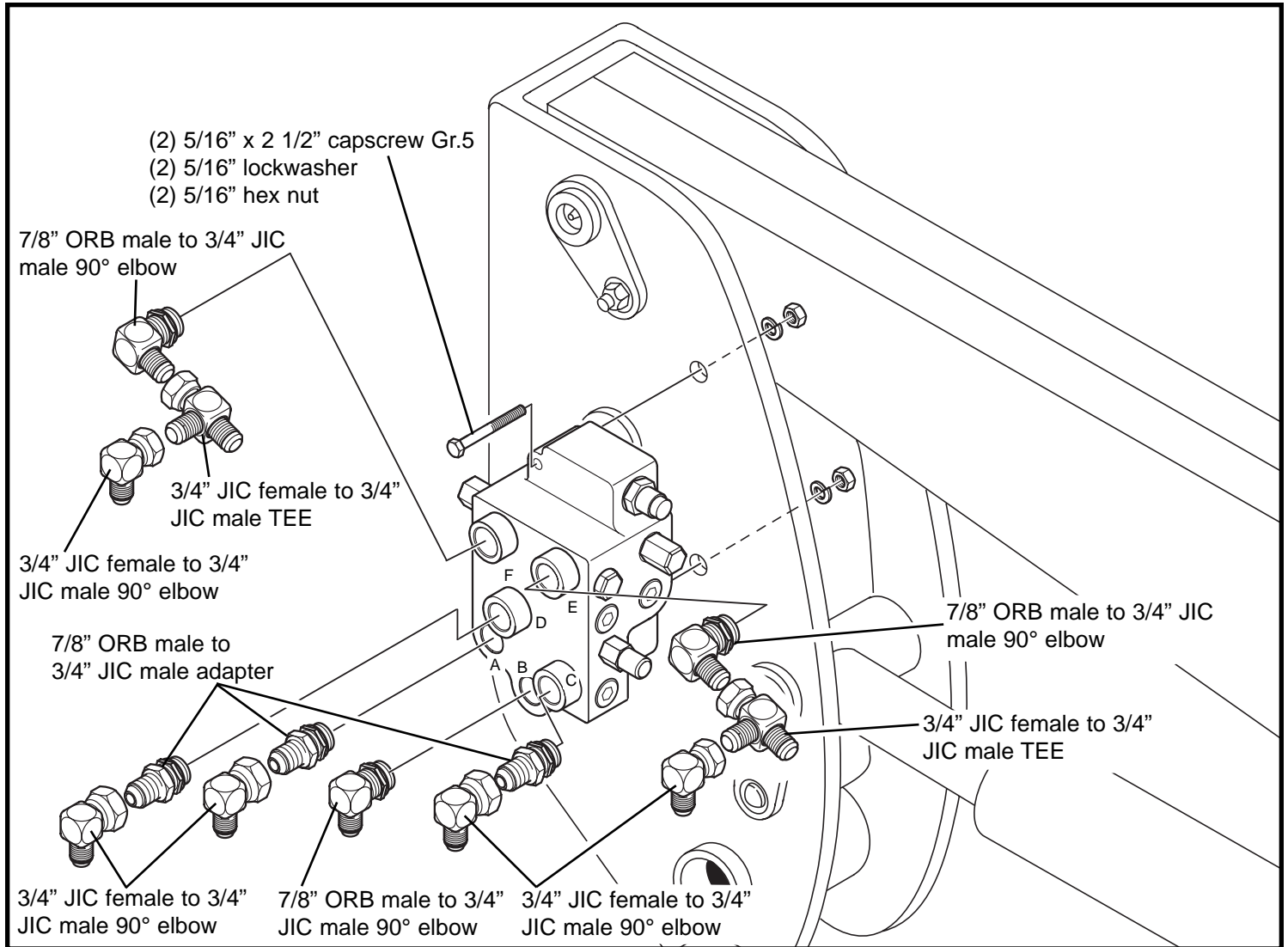
4. With clockwise motion, thread nipple into socket until nipple hex shoulders against ferrule.



5. Inspect assembly internally for cut or bulged tube obstructions and cleanliness.

50051690 SELF LEVELING VALVE BUNDLE MOUNTING INSTRUCTIONS BUSH HOG 3545, 4045, 5045 & 6045 MID MOUNT FRONT END LOADERS

~ ASSEMBLY INSTRUCTIONS ~



1. Attach self leveling valve to the right hand pedestal using the (2) 5/16"- 2 1/2" Gr. 5 capscrews, 5/16" lockwashers and 5/16" hex nuts provided in kit.
2. In ports A, C, & D install a 7/8" ORB male - 3/4" JIC male straight thread adapter in each port. To each straight adapter attach a 3/4" JIC female - 3/4" JIC male 90° elbow.
3. In ports B, E & F install a 7/8" ORB male - 3/4" JIC male 90° elbow into each port.
4. Install a 3/4" JIC female - 3/4" JIC male TEE to each of the 90° elbows in ports E & F with the single leg pointing out. Install a 3/4" JIC female - 3/4" JIC male 90° elbow to each outward pointing leg of TEE's.

05/03/06

62-06

Instruction Sheet 50051610

A-Attach to metal line on mainframe that is connected to the Base End of the lift cylinder (color code blue) using a 68" hydraulic hose and adapter provided in kit.

B-Attach to control valve at port that controls Base End of the lift cylinder, (color code blue).

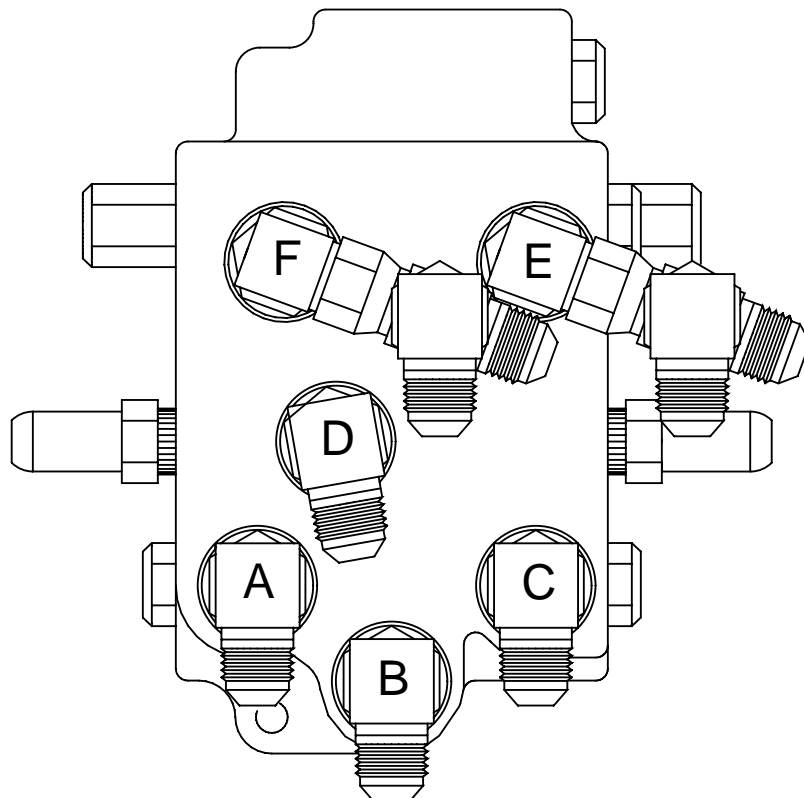
C-Attach to metal line on mainframe that is connected to the Rod End of the lift cylinder (color code red) using a 68" hydraulic hose and adapter provided in kit.

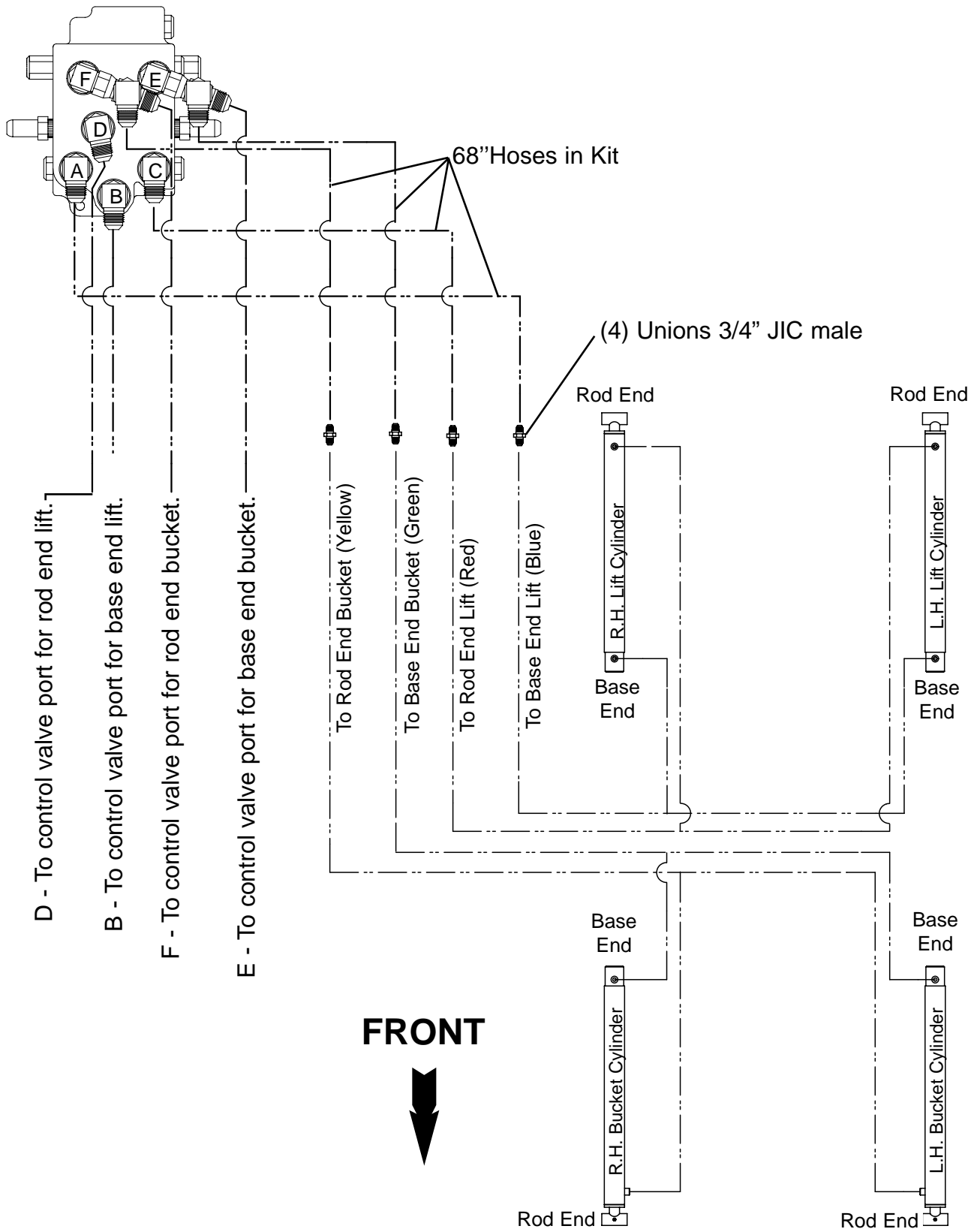
D-Attach to control valve at port that controls Rod End of the lift cylinder, (color code red).

E-Attach one side of TEE to metal line on mainframe that is connected to the Base End of the bucket cylinder (color code green) using a 68" hydraulic hose and adapter provided in kit.
Attach the additional side of TEE to the control valve port that controls the Base End of the bucket cylinder.

F- Attach one side of TEE to metal line on mainframe that is connected to the Rod End of the bucket cylinder (color code yellow) using a 68" hydraulic hose and adapter provided in kit.
Attach the additional side of TEE to the control valve port that controls the Rod End of the bucket cylinder.

Note: Tie the (4) 68" hoses routed to the metal lines from the self leveling valve together with the ties provided in the kit. Use one of the ties to secure the hose bundle to the inside of the pedestal by looping the tie through one of the square holes toward the inside rear of the pedestal and around the hose bundle.





DESCRIPTION

The hydraulic self-leveling option is designed to be incorporated into Bush Hog’s standard loader hydraulic circuit. A dual self-level valve controls flow throughout the system so as to maintain a nearly constant position of the loader attachment relative to the ground. The valve performs this function in both the raising and lowering mode. The bucket (or other attachment) may be operated at any time, independent of the self-level valve, giving the operator the ability to reposition it throughout the work cycle.

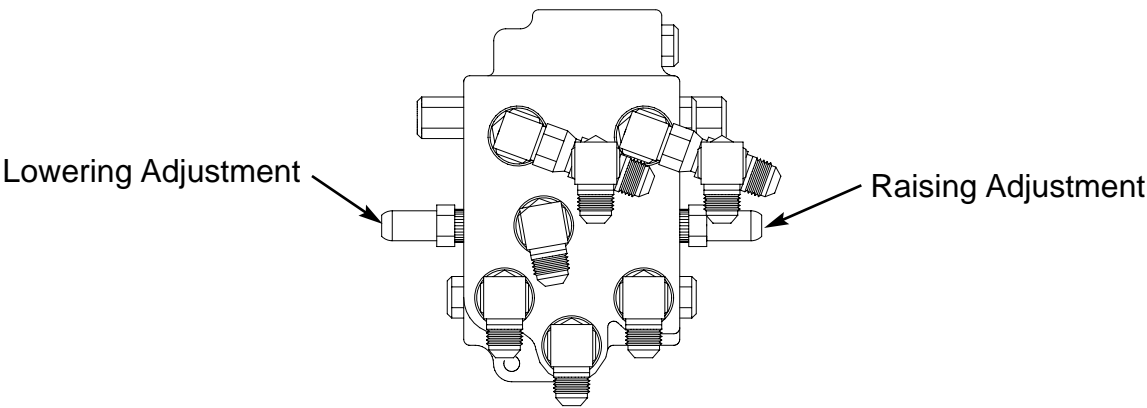
NOTE: IF THE LOADER ATTACHMENT ROLLS COMPLETELY BACK WHILE LOWERING THE BOOM, DOWNWARD MOTION WILL CEASE; ROLL THE ATTACHMENT FORWARD TO CONTINUE LOWERING.

ADJUSTMENT

Since the same self-level valve is used on different Bush Hog loaders, adjustment of the valve may be required when installed on one particular loader or the other to obtain a preferred performance. There are two separate adjustment screws, one for the raising mode and one for the lowering mode. Remove the dust cap to access the adjustment screw and loosen the jam nut prior to adjusting. Adjustments should be made in 1/4 turn increments to achieve the desired motion according to the following logic:

- RAISING: Clockwise - More Rollback
 Counterclockwise - More Dump
- LOWERING: Clockwise - More Dump
 Counterclockwise - More Rollback

Being a “needle valve” type adjustment, a point is reached when backing the adjustment screw out further (counterclockwise) has no effect. The maximum effective range of adjustment in this situation is approximately 2-3 turns.

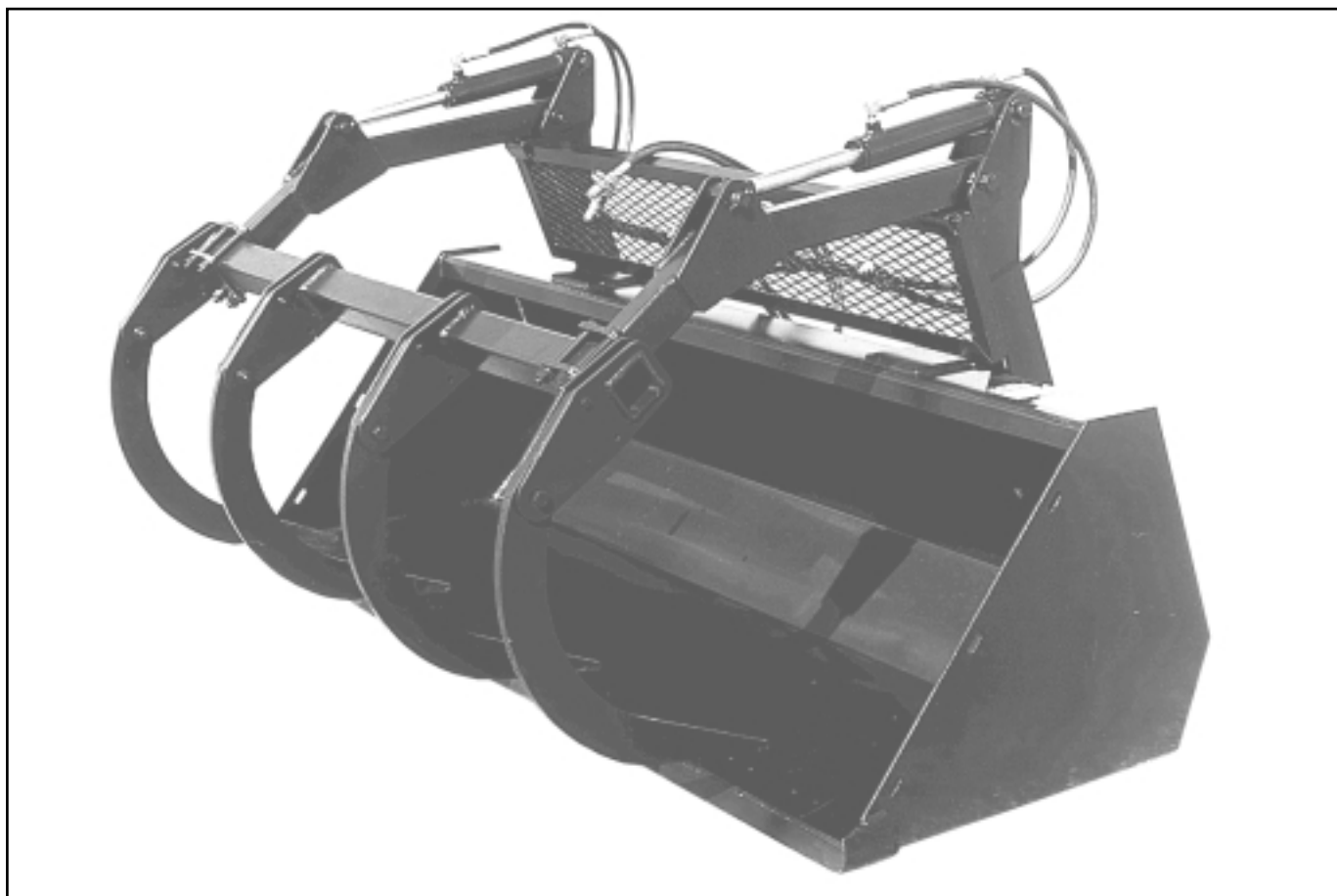


50051690 SELF LEVEL VALVE BUNDLE

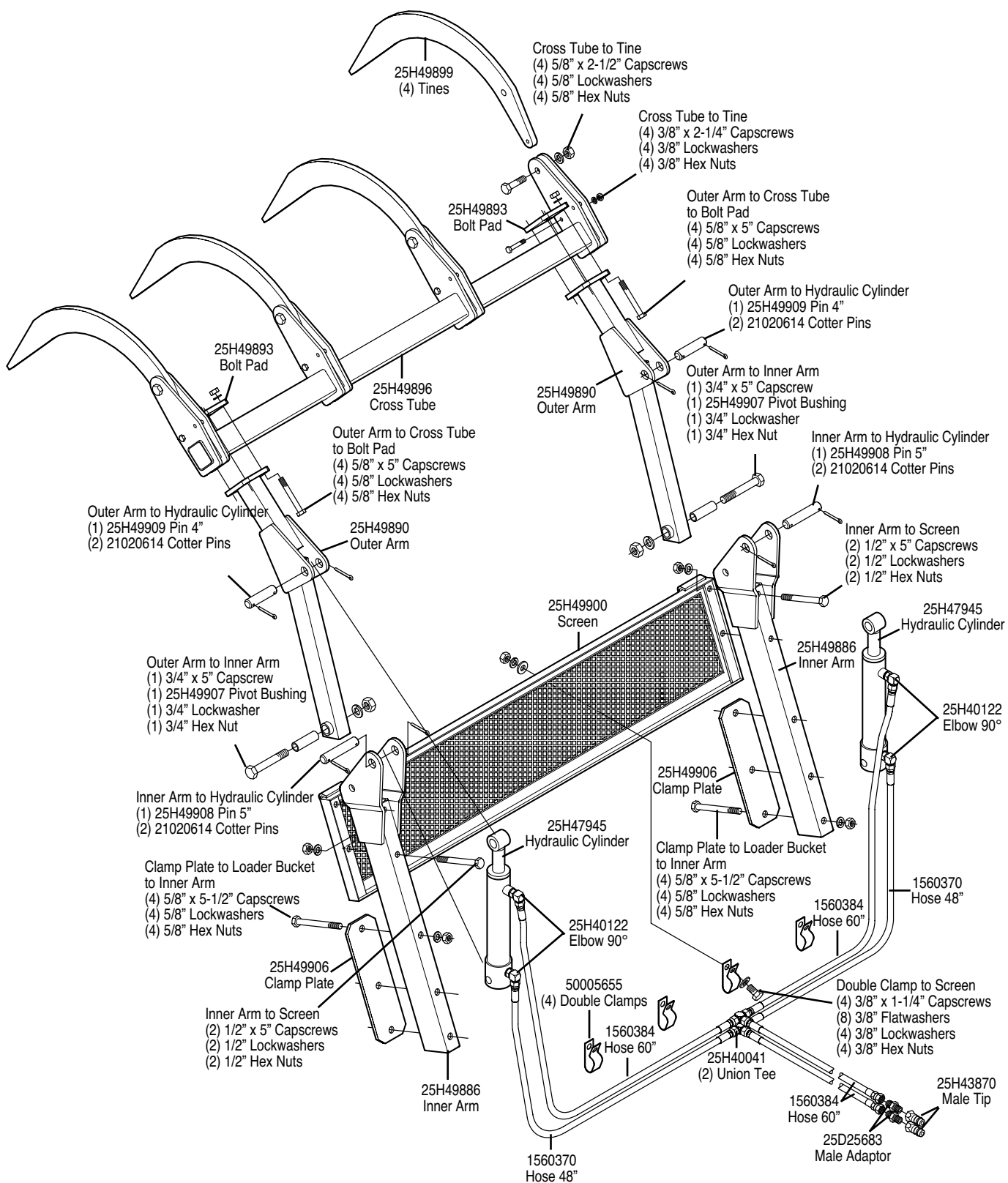
PART NUMBER	QTY.	PART NAME
25H50700	4	HYDRAULIC HOSE 68"
25H49136	1	DUAL SELF LEVEL VALVE
50027314	1	BAG OF HARDWARE
50051610	1	INSTRUCTION SHEET
68822	1	CRATE
50027314 BAG OF HARDWARE		
25H47571	5	NYLON CABLE TIES
25H43832	3	HYDRAULIC ADAPTER
25H43235	2	HYDRAULIC TEE
25H40576	5	HYDRAULIC ELBOW
25H40475	3	HYDRAULIC ELBOW
25H40043	4	HYDRAULIC ADAPTER
15528	2	HEX NUT 5/16"
15808	2	LOCKWASHER 5/16"
20504	2	CAPSCREW 5/16" X 2-1/2" GR.5
51260	1	BAG

MOUNTING INSTRUCTIONS FOR 24H49871 GRAPPLE ATTACHMENT

1. Attach the screen to inner arm with (4) 1/2" x 5" capscrew, (4) 1/2" lockwashers, and (4) 1/2" Hex Nuts.
2. Place a 1/2" shim on top of each hitch lug, on top of the bucket.
3. Center the screen, with inner arms attached, on rear of bucket with screen frame resting on 1/2" shims. Clamp in place.
4. Using holes in inner arms as a guide, drill (6) 11/16" diameter holes in rear of bucket.
5. Fasten in place with clamp plates inside bucket using (6) 5/8" x 5-1/2" capscrews, (6) 5/8" lockwashers, (6) 5/8" Hex Nuts. Remove 1/2" shims.
6. Complete assembly as shown on page 2.



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24H49871 GRAPPLE ATTACHMENT		
PART NUMBER	QTY.	PART NAME
25H47945	2	Hydraulic Cylinder
1560384	4	Hydraulic Hose 60"
1560370	2	Hydraulic Hose 48"
25H49906	2	Clamp Plate
25H49900	1	Screen
25H49899	4	Tine
25H49896	1	Cross Tube
25H49893	2	Bolt Pad
25H49890	2	Outer Arm
25H49886	2	Inner Arm
24H49885	1	Bag Of Hardware
25H49884	1	Instruction Sheet

24H49885 BAG OF HARDWARE		
PART NUMBER	QTY.	PART NAME
19517	2	Hex Nut 3/4" ZP
146	2	Lockwasher 3/4" ZP
44064	2	Capscrew 3/4" x 5" G5 ZP
15563	18	Hex Nut 5/8" ZP
19486	18	Lockwasher 5/8" ZP
20415	6	Capscrew 5/8" x 5-1/2" G5 ZP
20763	8	Capscrew 5/8" x 5" G5 ZP
44008	4	Capscrew 5/8" x 2-1/2" G5 ZP
8151600	4	Hex Nut 1/2" ZP
15806	4	Lockwasher 1/2" ZP
44030	4	Capscrew 1/2" x 5" ZP
8151200	8	Hex Nut 3/8" ZP
15812	8	Lockwasher 3/8" ZP
15915	8	Flatwasher 3/8" ZP
20048	4	Capscrew 3/8" x 2-1/4" G5 ZP
1161212	4	Capscrew 3/8" x 1-1/4" G5 ZP
21020614	4	Cotter Pin 3/16" x 1-1/2"
25H49909	2	Pin 4"
25H49908	2	Pin 5"
25H49907	2	Pivot Bushing
50005655	4	Double Clamp
25H43870	2	Male Tip
25H40122	4	Elbow 90°
25H40041	2	Union Tee
25D25683	2	Male Adaptor
51260	1	Bag



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